TPH0827/TLX

TX 35 Teleprinter Installation & Maintenance

Telex & PTS Engineering Branch,
Commercial Services Department,
Headquarters

Telecom Australia

TELECOM TECHNICAL PUBLICATION

TITLE: TX35 Teleprinter Installation and Maintenance

ISSUE NO: 1 DATE: December 1983

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Telex and PTS Engineering Branch

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TP NO: TPH0827/TLX
DISTRIBUTION CODING : 2G, 4C, 4G, 4L
FILING CATEGORY : G

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TX35 Teleprinter (Telex 2000) - Telex Installation Instructions

1. General

1.1 The TX35 teleprinter is an electronic teleprinter designed for use in the telex service.

Facilities provided by the TX35 include:

- A Visual Display Unit for ease of message preparation and correction.
- Electronic memory for message storage.
- Automatic calling.
- Retry of messages which encounter service codes.
- Deffered message delivery.
- Abbreviated numbering.
- Full tabulations facilities.
- Message logging facilities.
- Message storage on floppy disk (optional)
- Extended Alarms (optional)

1.2 The answer-back device consists of a plug-in Programmable Read-Only Memory (PROM). This should be coded and checked in advance of actual installation so as to avoid unnecessary delays.

1.3 Installations should not be made in any location which is either hazardous or difficult to access during normal working hours of operation of the service, or which is subject to ambient temperatures outside the range 0°C - 45°C, or to humidity in excess of 85%. When a customer requires the installation to be made in an environment not conforming to these specifications advice of the conditions and the customers name should be forwarded to Headquarters for consultation.

1.4 Only 220-260 Volts 50Hz AC power is to be used. DC power is not permitted. Where the voltage is outside these limits the customer is to supply a transformer, incorporating voltage stabilisation if necessary, with a 240 Volt secondary which should be terminated in a standard 3 pin power switch outlet with neon pilot light.

1.5 It is preferred that the customer provide a 3-pin power outlet with neon pilot light exclusively for the connection of the teleprinter apparatus, by and at the expense of the Applicant. The power wiring must be in accordance with the relevant paragraphs of Standards Association of Australia, Wiring Rules AS3000 parts 1 and 2 and be protected by a 6 Amp fuse.

1.6 Not more than two teleprinters shall be connected to any one power circuit.

1.7 New installations or conversions should not be made if there is any doubt as to the safety of a power outlet.

1.8 The teleprinter should be located within one metre from the power outlet. However, in the case of conversion from old style machines on Commission services, some discretion should be excercised in this regard.

1.9 The TX35 teleprinter is designed to stand directly on a normal office table, without any special fitting or table modification. A table area of 800mm x 1000mm is specified as the minimum for this machine. Installations should not be made on a smaller area, except where a separate, adequate maintenance area is made available by the customer. Space must be left at the rear of the table to allow the paper to feed out of the teleprinter without hinderance.

1.10 The feedback label attached to the teleprinter by the manufacturer should be filled in and forwarded by the installer in accordance with E.I. MATERIALS Quality Assurance P0002, TELEPRINTER FEEDBACK LABELS.

2. Technical Data

Modulation Speed	Set to 50 baud
Signalling Code	CCITT Alphabet No 2
Interface	Double Current or FSK
No of printed columns	69
Dimensions	Width 605mm approx Length 750mm approx Height 340mm approx
Weight	34 kg approx (including paper roll and disk facility)
Paper Roll	Diameter 125mm Width 210mm
Floppy Disk	5 1/4" Single Sided, Double Density One physical Index hole. No Sector holes.
Power Requirements	220 - 260 Volts AC, 50Hz 240 VA 70 VA in standby mode
Operating Environment (without disk option)	0°C to 45°C Humidity 85% max
Operating Environment (with disk option)	10°C to 45°C Humidity 8% to 80%

Screen Image	Width 145 to 160 mm Height 90 to 100 mm
Alarm Contacts	100 Volt maximum 250 mA maximum

3. Switch and Strap Settings

3.1 TX35 teleprinters are supplied under contract with all switch and strap settings made appropriate for telex installation.

3.2 CARTE INTERFACE IMPRIMANTE

Jumper SW1 - Not Used.
Jumper SW2 - Not Used.
Jumper SW3 - Not Used.

Jumper SW4 - Set to position 2
Position 1 - Tractor Feed
Position 2 - Friction Feed

Jumper SW5 - Set to position 1
Position 1 - Seven needle print head
Position 2 - Nine needle print head

3.3 CARTE INTERFACE VISUALISATION

Jumper S1 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing.

Jumper S2 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

3.4 CARTE MPU RAM EPROM

Jumper S1 - Set to position 1
Position 1 - Working position
Position 2 - EPROM programming *

Jumper S2 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

Jumper S3 - Set to position 1
Position 1 - Working position
Position 2 - EPROM programming *

* with external programming device.

Strap S45 - Not to be fitted
In - Enables EPROM M45
Out - Disables EPROM M45

Strap S67 - Not to be fitted for preparation software (4 chip set)
- To be fitted for line software (5 chip set)
In - Enables EPROM M67
Out - Disables EPROM M67

3.5 CARTE EXTENSION ATX

Jumper S5 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

Jumper S6 - Set to position 1
Position 1 - Working position
Position 2 - EPROM programming *

* with external programming device.

3.6 CARTE INDICATIF + COMMANDE ADAPTATION

Jumper S1 - Set to position I
Position I - Printing Unit
Position LPI - Reader, Punch and Printing Unit.

Jumper S2 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

Jumper S3 - Set to position 75
Position 75 - 75 baud if 75 baud selected on interface board.
Position 150 - 150 baud if 75 baud selected on interface board.

Jumper S4 - Set to position 100
Position 100 - 100 baud if 100 baud selected on interface board.
Position 200 - 200 baud if 100 baud selected on interface board.

Jumper S5 - Set to position TX
Position PP - No outgoing call/clear
Position TX - Outgoing call/clear

Jumper S6 - Set to position NEF
Position EFA - call/clear pulse
Position NEF - No call/clear pulse

Jumper S7 - Set to position TX
Position PP - No incoming call/clear
Position TX - Incoming call/clear

Switch SWO - Operator to select
Position A - Transmitted messages not erased
Position B - Erase transmitted messages.

Switch SW1 - Operator to select
Position A - No storage of received messages
Position B - Store received messages

Switch SW2 - Operator to select
Position A - Single line feed
Position B - Double line feed

Switch SW3 - Operator to select
Position A - 2 line feed page up
Position B - 6 line feed page up

Switch SW4/1 - Set to position 1 if disk option fitted
otherwise set to position 0
Position 1 - Disk option enabled
Position 0 - Disk option disabled

Switch SW4/2 - Set to position 1
Position 1 - Retry facility enabled
Position 0 - Retry facility disabled

Switch SW4/3 - Set to position 1
Position 1 - Momentary audible alarm
Position 0 - Continuous audible alarm

Switch SW4/4 - Set to position 1
Position 1 - Answerback not required before text
Position 0 - Answerback to be sent before text

Switch SW4/5 - Set to position 1
Position 1 - keyboard selection
Position 0 - dial selection

Switch SW4/6 - Set to position 1
Position 1 - Figures "D" not stored
Position 0 - Figures "D" stored

Switch SW4/7 - Set to position 1
Position 1 - No retry message priority
Position 0 - Retry message priority

Switch SW4/8 - Set to position 1
Position 1 - 3 or 4 wire circuit
Position 0 - 2 wire circuit

3.7 RACCORDEMENT D'EXPLOITATION
(Line connection module, main board)

Switch SW1 - Set to position 0
Position 0 - Working
Position 1 - Testing

Jumper S1 - Set in position 2
Position 1 - Surge arrestors connected to OA
Position 2 - Surge arrestors connected to OTG

3.8 CARTE PARAFOUDRE LIGNE (Line protection board)

Jumper S1 - Set in position 1
Position 1 - OB not connected to OTG
Position 2 - OB connected to OTG

3.9 CARTE FORMATEUR DISQUE SOUPLE

Jumper S1 - Set in position FDC
Position FDC -
Position PIA -

Jumper S2 - Set in position DD
Position DD -
Position SD -

Jumper S3 - Set in position M1
Position M1 -
Position M2 -

Jumper S4 - Set in position CLK
Position CLK -
Position HE -
Position TE -

Jumper S5 - Set in position 1
Position 1 -
Position 2 -

Jumper S6 - Set in position 0
Position 0 -
Position 1 -

Jumper S7 - Set in position 1 on SHUGART SA 200 and TANDON TM 50-1 and in position 0 on TEAC FD 55-A
Position 0 -
Position 1 -

Jumper S8 - Set in position MX on SHUGART SA 200 and TANDON TM 50-1 and in position DS2 on TEAC FD 55-A
Position MX -
Position DS2 -

Jumpers S9 - Set in positions DL-34 and 34-10
Position DL -
Position 34 -
Position 10 -
Position 0 -

3.10 Disk Drive

There are three types of floppy disk drives used with TX35 :

SHUGART SA 200
If straps are labelled DSO, DS1, DS2 and DS3 then strap DS1 should be fitted.

If straps are labelled DS1, DS2, DS3 and DS4 then strap DS2 should be fitted.

When additional straps MM and MS are present on the board, strap MM should be fitted.

TANDON TM 50-1
Strap DS1 (5-12) should be fitted.

TEAK FD 55-A
Straps MX, HM and DSO should be fitted.

3.11 CARTE ADAPTATION TG4

Switch SW1 - Set in position 50
Position 50 - 50 baud
Position 75 - 75 baud
Position 100 - 100 baud
(see also 3.6)

Switch SW2 - Set in position W
Position W - Working
Position 0 - Line Open
Position L - Line Looped
Position E - Earth
Position T - Line Transposed

Switch 4 - Set in position 2
Position 1 - Space on line (Transmit)
Position 2 - Mark on line (Transmit)

Switch 5 - Set in position 2
Position 1 - With proceed to select
Position 2 - Without proceed to select

Switch 6 - Set in position 2
Position 1 - With Call Connect
Position 2 - Without Call Connect

Switch 7 - Set in position 2
Position 1 - Space on line (Receive)
Position 2 - Mark on line (Receive)

3.12 CARTE MODEM INTERFACE

4. Preparation

4.1 Unpack the TX35, making sure that all packing material is removed from inside the teleprinter. Note! The plastic cover over the VDU screen must also be removed.

4.2 After unpacking the TX35 teleprinter the following items must be fitted:

(a) Ribbon cassette
(b) Paper spindle and paper roll
(c) Wire paper deflector
(d) Power cable
(e) Floppy disk (if option fitted)
(f) Copy holder extension piece
(g) CARTE ADAPTATION TG4 or CARTE MODEM INTERFACE as appropriate

4.3 The TX35 is supplied with the battery module disconnected. Connect the 8 pin connector (wired to the mother board) to the battery module. Note, the battery module should be disconnected whenever the TX35 is removed from service.

4.4 For line connection and mains connection diagrams see CG-2075 (Appendix E).

4.5 Install the coded answerback PROM in position Z12 on the INDICATIF + COMMANDE ADAPTATION board.

The answer-back PROM is to be coded in accordance with the relevant format described in Technical Publication TPH0828/TLX, and the Telegraph Order. The method and equipment to be employed is described in Technical Publication TPH0829/TLX. Any changes from the standard must be referred and agreed to by the Supervising Engineer, Telex Terminal Section Headquarters.

5. Auto-Test Facility

5.1 Principal

The TX35 is provided with self testing facilities. These facilities are activated by depressing the "RAZ" button located on the rear of the TX35. Testing is then carried out in four phases.

5.2 Phase 1

The three units (line, preparation and printer) undergo independant tests.

5.2.1 Printer Unit

Print head resets to start of line.

5.2.2 Preparation Unit

All LED's are illuminated for one second. The screen is filled with dots for one second. REPROM contents are checked. RAM is tested (contents is preserved). PIA's are tested.

At the end of these tests:

if the preparation unit is working
- all LED's on operation switches, are off.
- "END OF VDU TESTING" is displayed

if the preparation unit is not working
- two LED's on the operation switches illuminate
- a number is displayed on the screen.

LED's ON	SCREEN DISPLAY	FAULT
NONE	NONE	Preparation Unit MPU not functioning.
PREPARATION CALL/CLEAR	01 **	RAM malfunction (prep unit)
DISPLAY AUTOMATIC CALLING	02 ##	REPROM malfunction (prep unit)
PRINTING AUTOMATIC RETRY	03.00	INTERFACE VISUALIZATION board malfunction
DUPLICATION ABB NUMBERING	04.XX	INTERFACE CLAVIER +ECHANGE board malfunction.

** is a 2 digit number, 00 to 15
is a 2 digit number, 00 to 23
XX is a 2 digit number, 00 to 02

This information is used to isolate faulty components by the repair contractor.

5.2.3 Line Unit

Buzzer sounds once for 500 msec. Sending line is set to idle clear. Alarm relays momentarily close. REPROM contents are checked. RAM is tested (contents is preserved). PIA's are tested.

At the end of these tests:

if the line unit is working
- phase 2 is commenced

if the line unit is not working
- the alarm sounds with a number of pulses.

NUMBER OF PULSES	FAULT
NONE	Line Unit MPU not functioning.
1	RAM malfunction (line unit)
2	REPROM malfunction (line unit)
3	INDICATIF + COMMANDE ADAPTATION board malfunction
4	ACIA + ECHANGES board malfunction
5	FORMATEUR DISQUE SOUPLE board malfunction

Any faulty RAM used as message storage is displayed during phase 3. This is displayed in the service message field of the screen. eg. "CHECK OPTION 01-06". This information is used by the repair contractor.

5.3 Phase 2

The line and preparation units attempt to communicate with each other and conduct various communication checks. If the tests prove correct phase 3 commences. If the tests prove incorrect the following faults are indicated.

INDICATION	FAULT
Intermittent audible alarm.	Preparation unit malfunction.
Screen flashes and intermittent audible alarm.	Electrical connection fault between both units.
Continuous audible alarm.	Print Unit malfunction.

5.4 Phase 3

The line unit sends the following information to be displayed by the preparation and printer units.

Displayed on Screen:

```
    -                       -       -       -     -232-     -....-
:    :     :     :     :     :     :     :     :     :     :     :
:
 END OF V.D.U. TESTING

PRINTER ..........:  END OF TESTS..-SOFTWARE...:
PREPARATION.......:  END OF TESTS..-SOFTWARE...:   Software numbers
LINE..............:  END OF TESTS..-SOFTWARE...:

V.D.U. TESTING...........:
ABCDEFGHIJKLMNOPQRSTUVWXYZ  1234567890  %$Ø  '()+,-./:=?
FIELD OPTIONS..:  (DIL switch settings, see 3.6)
ANSWERBACK.....:  (Subscribers answerback)
STORAGE MEMORY...........:  (Status)
```

Printed on paper :

```
PRINTER..........:  END OF TESTS..-SOFTWARE...:
PREPARATION......:  END OF TESTS..-SOFTWARE...:  Software numbers
LINE.............:  END OF TESTS..-SOFTWARE...:

PRINTER TESTING..........:
ABCDEFGHIJKLMNOPQRSTUVWXYZ  1234567890  %$Ø  '()+,-./:=?
ABCDEFGHIJKLMNOPQRSTUVWXYZ  1234567890  %$Ø  '()+,-./:=?
ABCDEFGHIJKLMNOPQRSTUVWXYZ  1234567890  %$Ø  '()+,-./:=?

FIELD OPTIONS..:  (DIL switch settings, see 3.6)

ANSWERBACK.....:  (subscribers answerback)

STORAGE MEMORY..........:  (Status)
```

If a fault occurs during this operation the teleprinter will shift to the "locked" mode. If no fault occurs phase 4 will commence.

5.5 Phase 4

The following menu is displayed:

```
INIT MEMORY.....: M?
INTEGRATED TEST.: T?
INIT TIME.......: H?
INIT DISK.......: F?  (if disk option fitted)
```

Depress M to erase memory.
Depress H to set time and date.
Depress F to format a diskette.

(for further details see the Telex 2000 operators handbook).

Depress T to display the following menu:

```
KEYBOARD TEST      :C?
LINE TEST          :L?
DRIVE TEST         :R?
DISK TEST          :D?
STAND-BY           :S?
```

If C key is depressed
- "KEYBOARD TEST...." is displayed
- Each time a key is depressed its binary code is displayed
- No action for 10 secs returns teleprinter to original menu.

If L key is depressed
- if "TEST" switch (next to "RAZ" button) is in "0" position then "NON LOOPED LINE" is displayed on service line and original menu is displayed.

- if "TEST" switch is in "1" position then "LINE TESTING..." is displayed and RY test starts. The RY test is displayed and printed.

- to stop RY test return "TEST" switch to "0" position. The original test menu will be displayed.

If R key is depressed
- if no disk present then "NO DISK" is displayed on service line

- if disk is in then disk drive is checked and if operational original menu is displayed

- if drive is faulty then "DISK ERROR" will be displayed on service line and original menu will be displayed (takes about 2 seconds)

If D key is depressed
- if no disk present then "NO DISK" is displayed on service line

- if disk is in, then disk read-write is checked and if operational, original menu is displayed (takes about one minute)

If S key is depressed
- if time or date were not set within the last 5 minutes the teleprinter will go to a standby mode

- if time or date were set within the last 5 minutes, the teleprinter will go to idle state

If no keys are depressed during phase 4 the TX35 will return to idle clear within 20 seconds. The TX35 is then ready for operation.

TX35 Teleprinter (Telex 2000) - Maintenance Procedures

6. General

6.1 The following procedures are to be adopted when rectifying faults in the machine on the subscribers premises.

(a) A functional test is carried out to define the existence and nature of the fault.

(b) The fault is isolated and the faulty module replaced.

(c) A functional check is carried out to check that the fault has been rectified.

6.2 All faulty modules are to be returned to the Contractor for repair. Repairs will be carried out by the supplier either:-

(a) Under the equipment guarantee conditions.

(b) Under the repair contract conditions.

6.3 Faulty modules returned for repair should be packed either in the same or similar packaging in which the spare modules were packed. The screen of VDU modules should also be covered in a plastic wrap similar to that in which they are supplied.

WARNING: Before any modules are replaced during maintenance, teleprinter must be in idle state and the POWER must be switched OFF. Unless this advice is followed, it may be necessary to perform the automatic RAZ test to return the machine into the correct mode of operation.

7. Guarantee

7.1 CONDITION 1 A module will be guaranteed for 18 months from the date of module manufacture (year, week), indicated on the module usually on a red sticker, otherwise by a black or white stamp.

7.2 CONDITION 2 A guarantee of 15 months is to be given from the Date of Inspection of the machine the module came from if:

i) A module does not have the date of manufacture on it.

ii) A module is considered to be under guarantee but which is out of guarantee by the date of manufacture as in Condition 1.

The machine serial number is to be indicated on the fault label.

The "Date of Inspection" for machine serial numbers is shown on the "Certificate of Inspection" or S44 form. S44 forms are sent by Headquarters to State Engineering, who is to ensure that an updated sequential list of these machine serial numbers is given to Operations. The contractor also gets a copy of the S44's.

7.3 CONDITION 3 A guarantee of 3 months from the date of repair is to be given for all modules which have been repaired by the contractor. The date of repair will henceforth be indicated by a red stamp.

7.4 CONDITION 4 A repaired module will be under guarantee if there is significant reason to believe that the parts which failed had been repaired less than 12 months ago by the contractor. The State is to indicate that a 12 months guarantee should apply and the components in question be listed on the fault label attached to the module.

7.5 Note that these conditions will apply as follows:-

- Modules, and not machines, are the only equipment covered by guarantee.
- A module will not be under guarantee unless there is proof of the guarantee ie. the dates on the module or indication on the fault label.
- Guarantee from the time of installation will not be valid.
- No attempt to repair modules covered by guarantee is to be made in the State.

8. Return of Faulty Modules to Supplier for Repair Under Guarantee

3.1 Faulty modules shall be labelled with a fault label (E501) complete with all details of the fault. The faulty module will be packed in a re-usable approved protective container and returned to the supplier for repair in Australia whose address is as follows:-

SAGEM Australia
122 Euston Road
ALEXANDRIA, N.S.W. 2015
Australia

8.2 Once a fault has been located do not attempt to repair it (eg. remove a component) as this will violate the terms of the guarantee.

8.3 Faulty modules should be despatched to the contractor by a parcels carrying service, despatch agent, or an appropriate fast Postal Service. Air freight should only be used where there is justification.

When the module has been despatched to the contractor a telex message detailing the type of module, module under guarantee, method of despatch, the date of despatch and address for the return of a replacement module will be sent to the contractor. (Telex No. 71572).
On receipt of the telex message from the State Service Centre the contractor will within two working days despatch the replacement module and send a telex to the State advising method and date of despatch.
Each State will maintain a file detailing the despatch and receipt of modules to and from the contractor.

8.4 The objectives for maintenance turn-around times are:-

90% of replacement modules be despatched within 2 working days from receipt of Telex advice.

Remaining 10% of replacement modules be despatched within 5 working days from receipt of Telex advice.

The above targets apply equally to modules both inside and outside of the guarantee terms.

8.5 When a module has been repaired the Contractor will stamp it with the date of repair. Eventually, this repaired module will be returned to Telecom as a replacement.

9. Repair After Expiration of Guarantee

9.1 Upon a faulty module being removed from a machine and returned to the State Service Centre it shall be labelled with a fault label (E501) complete with all relevant fault details. After testing by the State Service Centre, and details entered in a Fault Record Book, the module is to be clearly marked - "Non-Guarantee Repair" packaged and despatched to the contractor. At the time of despatch a Telex message will be sent to the Contactor indicating type of module, non-guarantee module, method of despatch, date of despatch, and address for the return of the replacement module.
Upon receipt of the Telex advice, the contractor will within two working days despatch a replacement module in approved packaging to the requested destination together with a Telex message indicating mode of transport, and date of despatch.

10. Procedure for Contentious Guarantee of Repair of Modules

10.1 In any case where the contractor contends the State claim that a module is under guarantee the contractor will telex the State within one working day after receipt of the module; if the State does not agree with the reasons given for the module not being eligible for guarantee the State is to immediately make contact with Headquarters:

Supervising Engineer
Telex Terminal Section
Telex and PTS Division
Commercial Services Department
Telex : 134875

10.2 The decision on the guarantee of a module made by Headquarters will be final.

11. Performance Reports

11.1 A performance report providing maintenance statistics is required to be provided to the Supervising Engineer Telex Terminal Section, Headquarters. Details of the information required are similar to that provided by TX20 performance reports.

APPENDIX A

TX35 RFD CODES

If an automatic call attempt is unsuccessful, the connection will be cleared. A printout will include the Reason for Disconnection (RFD) code which may be followed by a figure from 0 to 9. This figure indicates the maximum number of retries remaining (in the automatic Retry mode) after the last call attempt.

Code		No of Attempts
01	CALL CONFIRMATION NOT RECEIVED	3
	Possible reasons: - faulty exchange - faulty line - faulty transmission and reception by TX35	
02	"GA" (PROCEED TO SELECT) SEQUENCE NOT RECEIVED	8
	Possible reasons : - call confirmation received, "GA" not received and transmitter times out - incorrect sequence received - spurious pulses on the network	
03	NOT APPLICABLE IN AUSTRALIA	
04	SECOND "GA" NOT RECEIVED	8
	Sequence of events: (Internationl call) - 1st selection (020) sent, no response and TX35 times out - 1st selection sent, exchange answerback received and TX35 times out	
	Possible reasons : - second "GA" not received - incorrect sequence received - spurious pulses on the network	
05	NOT APPLICABLE IN AUSTRALIA	
06	NOT APPLICABLE IN AUSTRALIA	

Code		No of Attempts
07	ANSWERBACK NOT RECEIVED DURING CONNECTION PHASE	3

Sequence of events (National call) : - "GA" received, 1st selection transmitted, answerback not received and TX35 times out

Sequence of events (International call) : - 2nd "GA" received, 2nd selection transmitted, answerback not received and TX35 times out

Possible reasons :
- called party faulty
- incorrect selection

NAB-08 NO ANSWERBACK DURING CONNECTION PHASE — 2

Sequence of events :
- 1st selection transmitted
- incorrect answerback received
- WRU transmitted
- no answerback and TX35 times out

Possible reasons :
- called party faulty
- exchange or line disturbance

CAB-09 CHECK ANSWERBACK DURING CONNECTION PHASE — 2

Sequence of events :
- 1st selection transmitted
- incorrect answerback received
- WRU transmitted
- incorrect answerback received and TX35 disconnects

Possible reasons :
- wrong called party
- incorrect answerback in verification field

NAB-10 NO ANSWERBACK DURING DISCONNECTION PHASE — 1

Sequence of events :
- call connected
- text transmission completed
- WRU transmitted
- no answerback or incorrect answerback received
- WRU transmitted again
- no answerback and TX35 times out

Possible reasons :
- called party faulty
- exchange or line disturbance
- call made to an overseas subscriber connected to a store and forward exchange
- call connection fault

Code		No of Attempts
CAB-11	CHECK ANSWERBACK DURING DISCONNECTION PHASE	1
	Sequence of events : - call connected - text transmission completed - WRU transmitted - incorrect answerback received - WRU transmitted again - incorrect answerback received and TX35 disconnects	
	Possible reason : - line or exchange disturbance - call connection fault	
12	BREAKBACK DURING MESSAGE TRANSMISSION	3
	Possible reasons : - 3 breakbacks and call cleared - B party transmission exceeds character limit (220)	
13	CLEARING SIGNAL RECEIVED WHILE WAITING FOR "GA"	6
	Sequence of events : - call confirmation received - clearing signal received either before "GA" sequence or immediately after "GA" received and before 1st selection transmitted	
	Possible reasons : - exchange disturbance - power off (A party) before 1st selection	
14	CLEARING SIGNAL RECEIVED DURING FIRST SELECTION	6
	Possible reasons : - exchange disconnects during 1st selection, (exchange fault)	
15	CLEARING SIGNAL RECEIVED BEFORE SECOND "GA"	6
	Possible reasons : - exchange disconnects after 1st selection - exchange disconnects after 1st answerback - exchange disconnects immediately after second "GA" - exchange sends ABFF (answerback format faulty) and disconnects - power off (A party) after 1st selection	

Code		No of Attempts
16	CLEARING SIGNAL RECEIVED DURING SECOND SELECTION	6
	Possible reason : - exchange disconnects during 2nd selection	
17	NOT APPLICABLE IN AUSTRALIA	
18	CLEARING SIGNAL RECEIVED DURING CONNECTION PHASE	6
	Possible reasons : (National call) - clearing signal received after 1st selection - clearing signal received after 1st answerback - power off (either party) after 1st selection	
	Possible reasons : (International call) - as for national call but after 2nd selection instead - 2nd selection not terminated with "+" - power off (either party) after 2nd selection	
19	CLEARING SIGNAL RECEIVED DURING MESSAGE TRANSMISSION	6
	Possible reasons : (National call) - B party disconnects at any stage between sending the 1st answerback and the end of message text transmission (before WRU sent) - power off (either party) during message transmission	
	Possible reasons : (International call) - as for national call but starting from the 1st answerback sent after 2nd selection - power off (either party) during message transmission	
20	CLEARING SIGNAL RECEIVED DURING DISCONNECTION PHASE	1
	Possible reasons : - message text transmitted, WRU sent and B party disconnects - message text transmitted, WRU sent, answerback received and B party disconnects - power off (either party) during disconnection phase	
OCC-21	CALLED SUBSCRIBER OCCUPIED	8
NC-22	NO CIRCUIT AVAILABLE AT PRESENT	8

ABS-23 CALLED PARTY ABSENT * 2

NA-24 NOT ADMITTED (UNAUTHORISED CALL) * 2

NP-25 NO PARTY (PARTY DOES NOT EXIST) * 2

NCH-26 NUMBER HAS BEEN CHANGED * 2

DER-27 CALLED TERMINAL OUT OF ORDER * 2
(out of order or changing paper roll)

MOM-28 MOMENT - MANUAL OPERATOR * 2
(use manual call mode)

BK-29 TIME OUT OR BREAK * 2
(from AXB20 only)

Possible reasons :
- time between characters on setting up a call or administering a group list exceeds 5 seconds
- incorrect selection information when setting up automatic conference and broadcast calls
- when administering group lists, BK indicates incorrect command format, invalid characters, non existent group list and exceeding list capacity

30 PRINTER FAULT DURING CONNECTION PHASE * *

Possible reasons :
- paper out
- printhead blocked
- printing unit fault

NOTE: This RFD code and the number of remaining retries are not printed on the page paper, but instead they are stored in the message log.

31 PRINTER FAULT DURING MESSAGE TRANSMISSION 8

Possible reasons :
- paper out
- printhead blocked
- printing unit fault

NOTE: This RFD code and the number of remaining retries are not printed on the page paper, but instead they are stored in the message log.

32 PRINTER FAULT DURING DISCONNECTION PHASE 8

Possible reasons :
- paper out
- printhead blocked
- printing unit fault

NOTE: This RFD code and the number of remaining retries are not printed on the page paper, but instead they are stored in the message log.

33 RECEIVE LINE OPEN DURING CONNECTION PHASE * *

Sequence of events :
- TX35 receive line open circuited during connection phase of call ie. until after B party answerback received
- if the circuit is left open, the code NDC (No Disconnect Current) will also be printed after a timeout

Possible reasons :
- maintenance switch rotated to wrong position
- line or exchange fault

34 RECEIVE LINE OPEN DURING MESSAGE TRANMISSION 8

Sequence of events :
- TX35 receive line open circuited during message text transmission phase of call
- if the circuit is left open, the code NDC (No Disconnect Current) will also be printed after a timeout

Possible reasons :
- maintenance switch rotated to wrong position
- line or exchange fault

35 RECEIVE LINE OPEN DURING DISCONNECTION PHASE 8

Sequence of events :
- TX35 receive line open circuited during disconnection phase of call ie. from after WRU sent at the end of message text until call disconnection
- NDC is printed if the line remains open circuited

Possible reasons :
- maintenance switch rotated to wrong position
- line or exchange fault

36 NOT APPLICABLE IN AUSTRALIA

37 NOT APPLICABLE IN AUSTRALIA

38 NOT APPLICABLE IN AUSTRALIA

39 SOFTWARE MALFUNCTION DURING CONNECTION PHASE * *

40 SOFTWARE MALFUNCTION DURING MESSAGE TRANSMISSION 8

41 SOFTWARE MALFUNCTION DURING DISCONNECTION PHASE 8

42 OPERATOR DISCONNECTS DURING CONNECTION PHASE * *

Possible reason : (National call) - operator disconnects before 1st answerback received

Possible reason : (International call) - operator disconnects between start of call and receiver's answerback (after 2nd "GA")

43 OPERATOR DISCONNECTS DURING MESSAGE TRANSMISSION * *

Possible reason : - operator disconnects during transmission of message text ie. from after reception of B party answerback until the end of the message

44 OPERATOR DISCONNECTS DURING DISCONNECTION PHASE * *

* Two attempts are allowed when two consecutive service codes from this group are encountered. Otherwise more attempts may be allowed eg. ABS followed by OCC will give 6 more retries.

* * Number of attempts depends on the RFD code encountered on the previous or on the next call attempt ie. number of retries is not influenced by these RFD codes.

APPENDIX B

FLOPPY DISK CARE AND HANDLING

The floppy disk is permanently packaged in a protective vinyl jacket, but some surfaces of the disk media are exposed. When not in use the disk is stored in a protective envelope. Instructions regarding general use, storage and environmental considerations are listed below.

Disk Usage

* To remove disk from envelope grasp disk by its upper edge and pull.

* When inserting disk into disk drive opening, don't force if resistance is encountered. Make sure disk is fully inserted before closing the door. This will prevent damage to the centre hole of the disk.

* Be careful not to touch exposed areas of the media when the disk has been removed from its protective envelope. Handle by jacket only.

* Don't eat, drink or smoke while handling the disk. Fluids, fingerprints, hair, dust and smoke particiles can all contaminate the disk surface. If a substance is spilled on the disk jacket, it can be removed and the data recovered providing the contaminant doesn't reach the recording surface.

* Replace the disk if it becomes contaminated. If a contaminated disk is used, the Read/Write head on the disk drive can become contaminated causing Read/Write errors. The contaminants can also be passed onto clean disks used in the drive.

* Don't place heavy objects on the disk, or fold or bend it. Paper clips, rubber bands and tape should not be used on the disk. Disks which become torn, folded or creased should be replaced.

* Disks should not be placed near magnetized objects or data can be lost eg. Telephone receiver handpieces. Motors and powercables can also affect disks.

* Never write on the disk jacket. Self-adhesive labels should be used for disk identification (don't apply label over any areas of exposed media). Write on label before placing it on the jacket and use only felt tipped pens. Don't use pencil as graphite particles or erasure residue can cause contamination.

Storage

* Return the disk to its envelope as soon as it is removed from the disk drive.

* Disks should be stored in specially designed containers, preferably the box that they came in.

Environmental Conditions

* Don't expose disks to direct sunlight or excessive heat. Don't store disks in motor vehicles, where extreme conditions can occur.

APPENDIX C

DISKETTE HEAD CLEANING

In order to keep valuable information stored on the diskettes, intact and error free, it may be necessary to occasionally clean the disk drive head. There are two ways of cleaning contaminated disk heads.

1. In cases of minor contamination of disk heads, special cleaning diskettes are used. Several manufacturers offer this product which usually consists of the cleaning diskettes and (not always) a bottle of cleaning fluid. Some diskettes are reusable and provide 10-15 cleaning runs, while others are disposable after use.

   The usual procedure is to saturate the cleaning diskette with cleaning fluid, slot it into the drive and engage the head for about 30 seconds. This is done by pressing the DISK switch followed by pressing DISPLAY 00 (in fact any message number will do). This should eliminate particles of dirt, dust and oxide that accumulate with normal use of the system. Also, this is the best and quickest way to clean diskette heads without any disassembly or mess.

   It is important to note that this should not be done too often (say every day) as friction can cause excessive wear of the disk head.

   Some of the more commonly available cleaning kits are listed below :

   Datalife - by Verbatim. Includes a special plastic jacket and 2 presaturated disposable cleaning disks. Replacement disks (without jacket) can then be purchased in packs of 10.

   3M - by Scotch. Includes special cleaning fluid and 2 reusable cleaning disks. Each disk can handle up to 15 cleanings.

   FLOPPICLENE - by Electrolube. Includes a bottle of cleaning fluid, protective glove and 50 disposable cleaning diskettes.

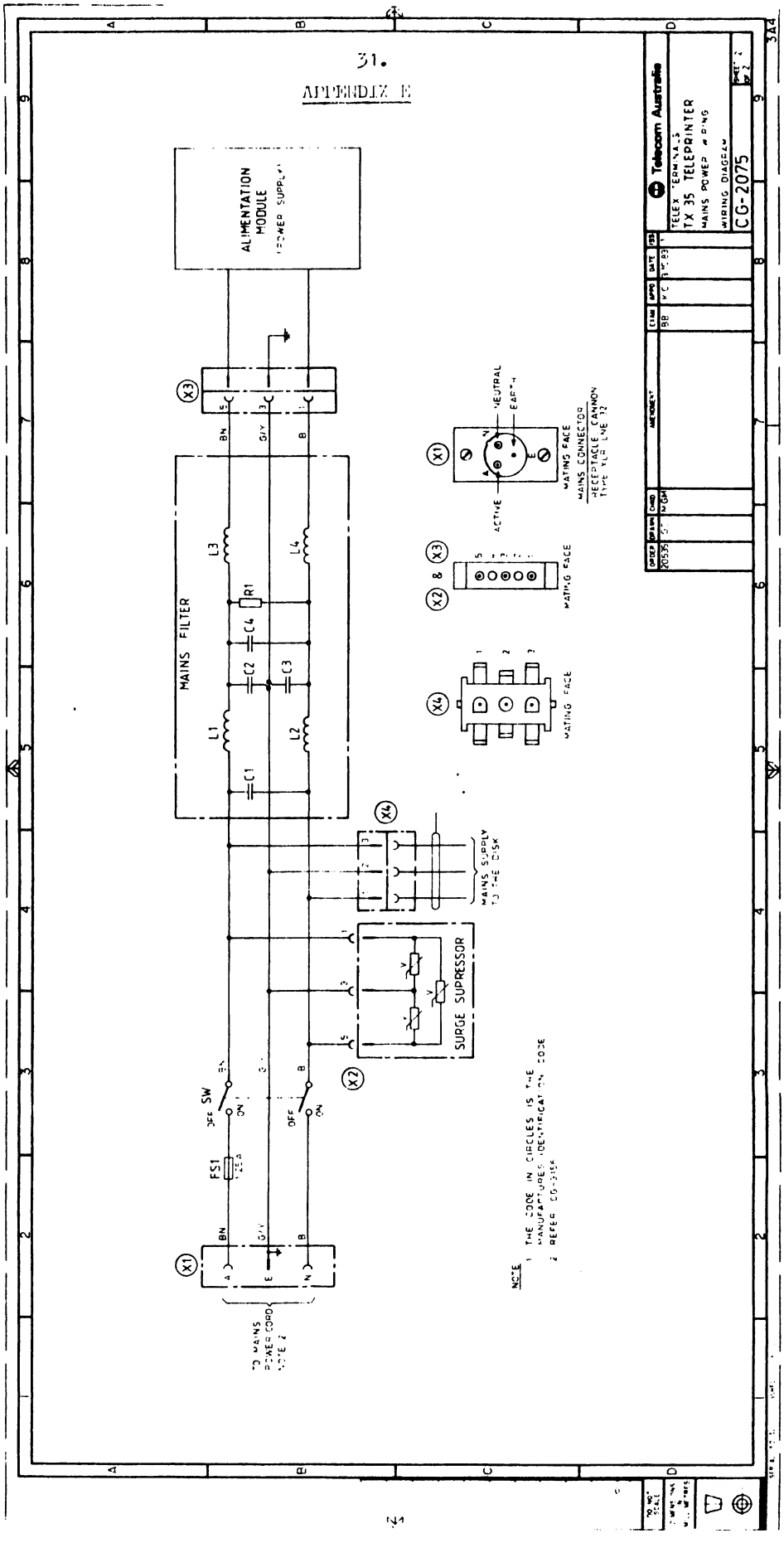
2. In cases of severe contamination of disk heads, cleaning diskettes should be used as a first measure. However, if it proves to be unsuccessful (after 2 - 3 runs) disk heads should be cleaned with cotton buds immersed in isopropyl alchohol (electronic grade). While cleaning the head, cotton buds should be moved in the direction of rotation of the disk thus minimising the possibility of damage. Note, that this is a very delicate operation and should be performed very carefully as excessive pressure can cause the misalignment of the head.

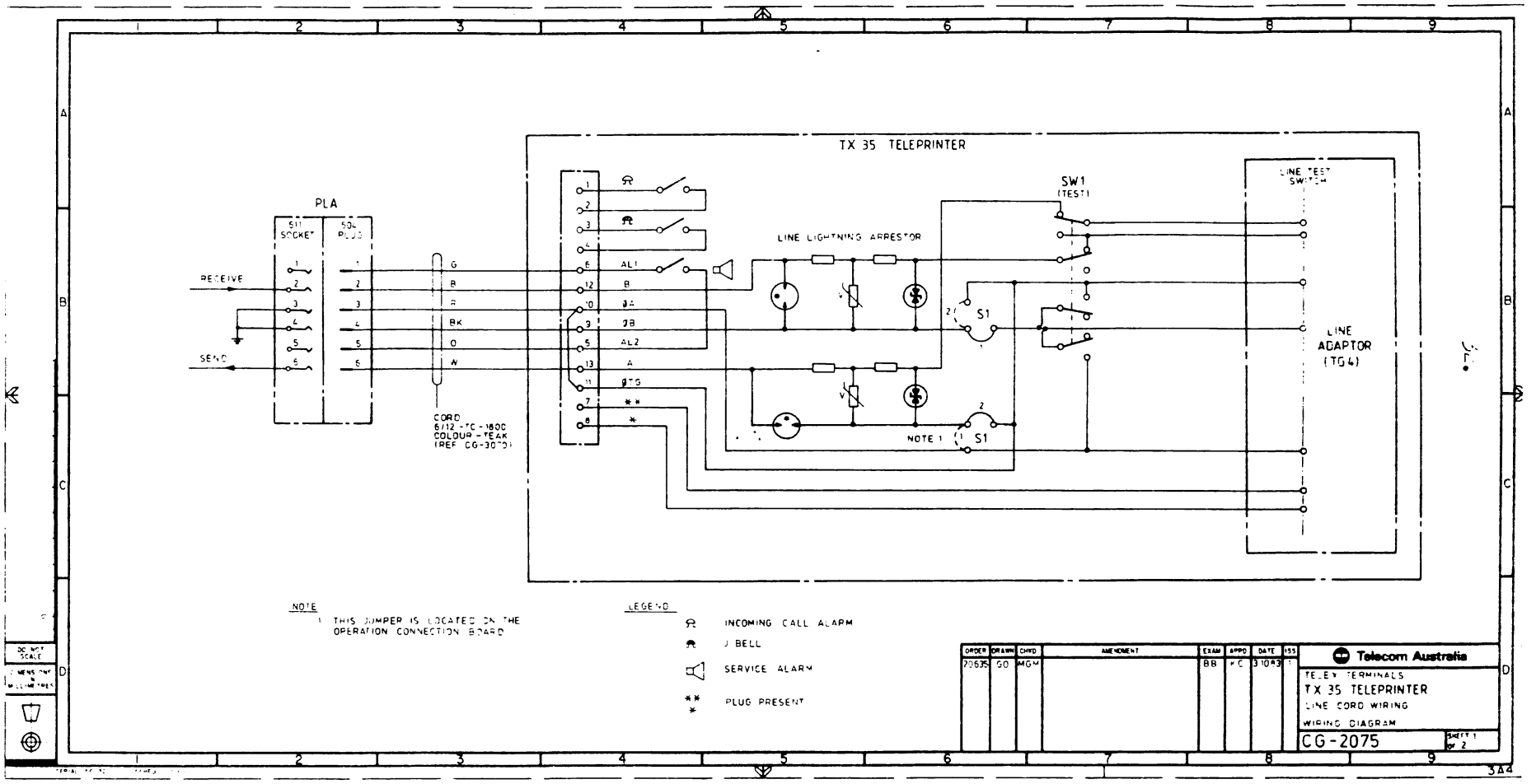
APPENDIX D

FORM FOR TX35LS PRINTED LINE LOG

PRINTED LINE LOG :	EXPLANATION :
-D=00:40-S:35A-H:02P00-RFD: 0	WITH RETRY - MESSAGE NO. 35 SUCCESSFULLY TRANSMITTED.
-D=00:40-W:35A-H:02P00-RFD:0CC6	WITH RETRY - MESSAGE NO. 35 WAITING TRANSMISSION, SERVICE CODE OCC RECEIVED AT LAST CALL ATTEMPT, SIX ATTEMPTS REMAINING.
-D=00:40-R:35A-H:02P00.....-CSM	WITH RETRY - MEMORY FILLED DURING RECEPTION OF MESSAGE NO. 35 (STORE INCOMING MESSAGES SELECTED).
-D=00:40.....-H:02P00.....-CSM	WITH RETRY - MEMORY FULL PRIOR TO RECEPTION OF MESSAGES (STORE INCOMING MESSAGES SELECTED)
-D=00:40-S:35A.....-RFD: 0	WITHOUT RETRY - SUCCESSFUL AUTOMATIC CALL.
-D=00:40-W:35A.....-RFD:CAB1	WITHOUT RETRY - AUTOMATIC CALL, ANSWERBACK FAILED VERIFICATION TEST, ONE ATTEMPT REMAINING.
-D=00:40-R:35A.....-CSM	WITHOUT RETRY - MEMORY FILLED DURING RECEPTION OF MESSAGE NO. 35 (STORE INCOMING MESSAGES SELECTED).
-D=00:40.....-CSM	WITHOUT RETRY - MEMORY FULL PRIOR TO RECEPTION OF MESSAGE (STORE INCOMING MESSAGES SELECTED)
-D=00:40.....	WITHOUT RETRY - MANUAL CALL.

APPENDIX E


ALIMENTATION MODULE
MAINS FILTER
L1
L2
L3
L4
C1
C2
C3
C4
R1
SURGE SUPPRESSOR
SW
FS1
MAINS SUPPLY TO THE DISK
TO MAINS POWER CORD
NEUTRAL
EARTH
ACTIVE
MATING FACE
MAINS CONNECTOR
RECEPTACLE CANNON
Telecom Australia
TELEX TERMINALS
TX 35 TELEPRINTER
MAINS POWER WIRING
WIRING DIAGRAM
CG-2075


TX 35 TELEPRINTER
PLA
511 SOCKET
504 PLUG
RECEIVE
SEND
CORD
6/12 -TC-1800
COLOUR - TEAK
(REF CG-3075)
LINE LIGHTNING ARRESTOR
SW1
(TEST)
S1
S1
NOTE 1
LINE TEST SWITCH
LINE ADAPTOR (TG4)
AL1
AL2
NOTE
1 THIS JUMPER IS LOCATED ON THE OPERATION CONNECTION BOARD
LEGEND
INCOMING CALL ALARM
BELL
SERVICE ALARM
PLUG PRESENT
DO NOT SCALE
DIMENSIONS IN MILLIMETRES
ORDER 70635
DRAWN GO
CHKD MGM
AMENDMENT
EXAM BB
APPD PC
DATE 31093
ISS 1
Telecom Australia
TELEX TERMINALS
TX 35 TELEPRINTER
LINE CORD WIRING
WIRING DIAGRAM
CG-2075
SHEET 1 OF 2
344

TELEPRINTER

TX 35

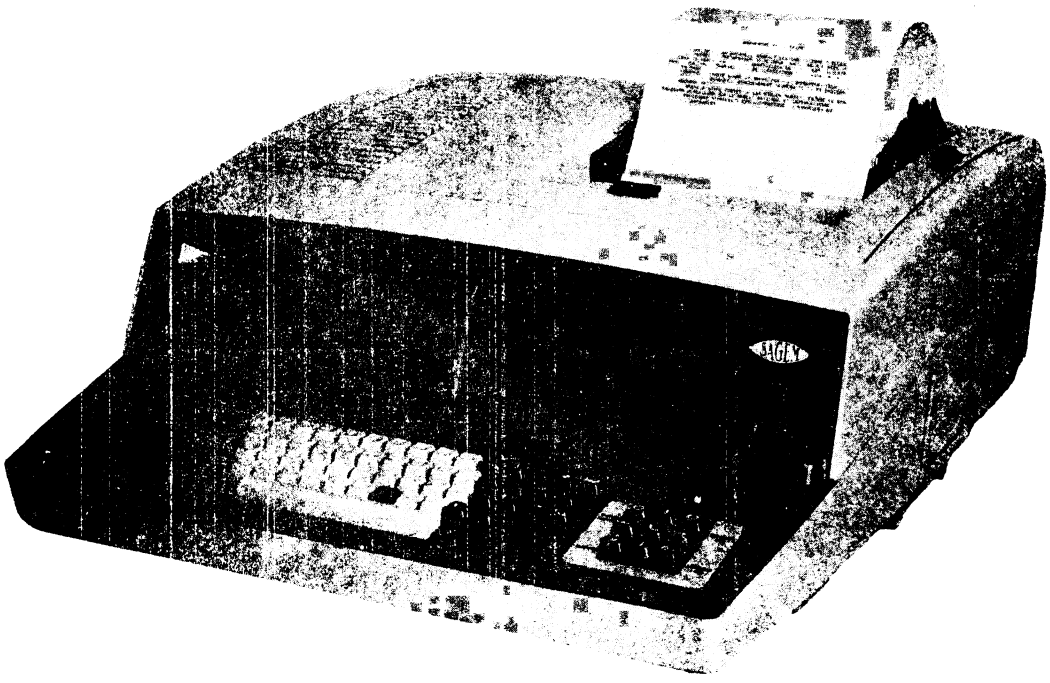
SERVICING TECHNICAL DOCUMENT

TECHNICAL DESCRIPTION

MAINTENANCE MANUAL

ILLUSTRATED CATALOGUE

SAGEM



TELEPRINTER TX35

FOREWORD

The TX 35 teleprinter SITE TECHNICAL DOCUMENT is in three parts :

1 - Description
2 - Maintenance Guide
3 - Illustrated parts list.

The foreword to the latter is in four languages : French, English, German and Spanish.

1

TECHNICAL DESCRIPTION

LIST OF CONTENTS

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1 GENERAL

The TX 35 unit is a compact TELEPRINTER with a DISPLAY SCREEN and a MEMORY. It is a TERMINAL designed for use with a communications network.

The TX 35 is of the typewriter type enabling preparation of messages on a display screen, immediate or later transmission of messages, and reception.

When the unit is energised but not in use, after a few minutes, it automatically switches over to STANDBY, which considerably reduces electrical consumption. In the standby mode, RECEPTION of a signal or LOCAL UTILISATION, immediately and automatically switches on the unit.

The memory content is safeguarded in case of a power failure.

Maintenance of the unit is facilitated by an autotest device which operates automatically when the power is switched on, or when selected by the maintenance operative.

The control logic of the electronic TX 35 unit is based on three microprocessors.

- The display screen and the memory facilitate the work of the operator. In fact, the typed text is displayed before being printed, which enables easy CORRECTION and MODIFICATION before on-line transmission.

- The unit avoids word cut-off at the end of a line. It also enables insertion of closing-up of characters, words or lines.

- The operator has fixed or programmable tabulation by means of a keyboard, with left or right-hand side centering.

- The built-in memory enables CONSERVATION of received and prepared TEXTS, and they are REUTILISABLE as required until erased by the operator.

  In addition, the memory enables the use of protected formulas.

- The prepared, received or transmitted texts are numbered automatically by the unit in order to compile the LOGBOOK which may be displayed or printed out as required. This enables rapid text scanning.

TEXT PREPARATION is compatible SIMULTANEOUSLY with message RECEPTION or TRANSMISSION.

- The network access and end of communication procedures are performed automatically or manually by the unit, as decided by the operator.

- An ABBREVIATED NUMBERING device enables the operator to simplify the call sign for frequently-called correspondents. The operator may program the abbreviated number table using the keyboard. Telex numbers of addressees are memorised and represented by a single letter from A to T (20 possibilities). After preparation of a text, the teleprinter automatically supplies the complete telex number when the single letter key is pressed.

- Messages received may be automatically recorded in the memory, if so selected by the operator.

2 TECHNICAL DATA

2.1 ADAPTATION TO A COMMUNICATIONS NETWORK

- The unit may be equipped with various electronic boards enabling adaptation to a communications network (consult us).
- Code used : CCITT N°2
- Symbols : type A, B ...
- Numbering : KEYBOARD type, dial
- Modulation speed : 50, 75 or 100 bauds.

The selector switch is located on the unit ADAPTOR board.

- Telegraphy :

  . overall arythmic distortion : < 2 %
  (without psophometric filter)

  . margin : ≥ 45 %

  . insensitivity to "under 1/2 a unit departure duration" pulses.

- Line current

  . current injector for transmission

  . current regulator for reception

- Telegraphy voltages

  $\pm$ 48/50 V; $\pm$ 60 V; $\pm$ 80 V double current

  0-100 V ; 0-120 V; 0-160 V single current

2.2 DISPLAY CHARACTERISTICS

The DISPLAY SCREEN consists of a small TV tube of the following size :

- diagonal : 240 mm approx.
- effective width : 200 mm approx.
- effective height : 150 mm approx.

Image persistency and brightness may be adjusted by means of a thumbwheel accessible to the operator, giving high operating comfort. An INDEX marks the operating location (characters in progress).

Writing is in matrix form (9 x 7 points), with the following characteristics :

- number of characters per line : 69, 72 or 80 (depending on option)
- number of text lines : 20
- service line : 1
- total number of lines : 22

2.3 PRINTING CHARACTERISTICS

Printing is in matrix form, by impact (standard ECMA42)

- number of characters : 64
  : matix 7 x (5 + 4)
- definition of characters : 3 to 6 types (optional)
- size of characters :
  . height : 2.7 mm
  . width : 1.8 mm
- number of characters per line : 69
- paper drive : friction
- paper width : 210 or 216 mm
- number of copies : 1 + 3
- horizontal spacing between two characters : 2.54 mm (10 ch/inch)
- vertical spacing between two characters :
  . single line spacing : 4.2 mm (1/6 inch)
  . double line spacing : 8.4 mm (1/3 inch)

The single and double line spacing switch is located on the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

- printing speed :
  . local (maximum) : 50 ch/s
  . on line depending on modulation speed chosen

- minimum sequence for line return : one "carriage return" character plus one "interline" character.
- end of line approach audible warning : on 60th character.
- SAGEM cartridge ink ribbon.

2.4 CHOICE OF PARAMETERS (PERSONNALISATION)

There are control switches located on the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

The main choices at the disposal of the operator are : memorisation of messages received, double or single line spacing, automatic paper release at the end of a communication.

The maintenance operative has other choices at his disposal, notably : 2-way alternating or integral 2-way communications, permanent or hold-to-operate control of the audible warning, remote control of the CALL CODE transmitter by the "D FIGURES" signals sequence, TELEPRINTER signal or CALL DIAL pulse numbering, "D FIGURES" memorisation, 2 or 3/4 wire mode operation.

2.5 MISCELLANEOUS DATA

- Mains power supply : 220 V ± 10 % - 50 Hz or 60 Hz ± 2 %

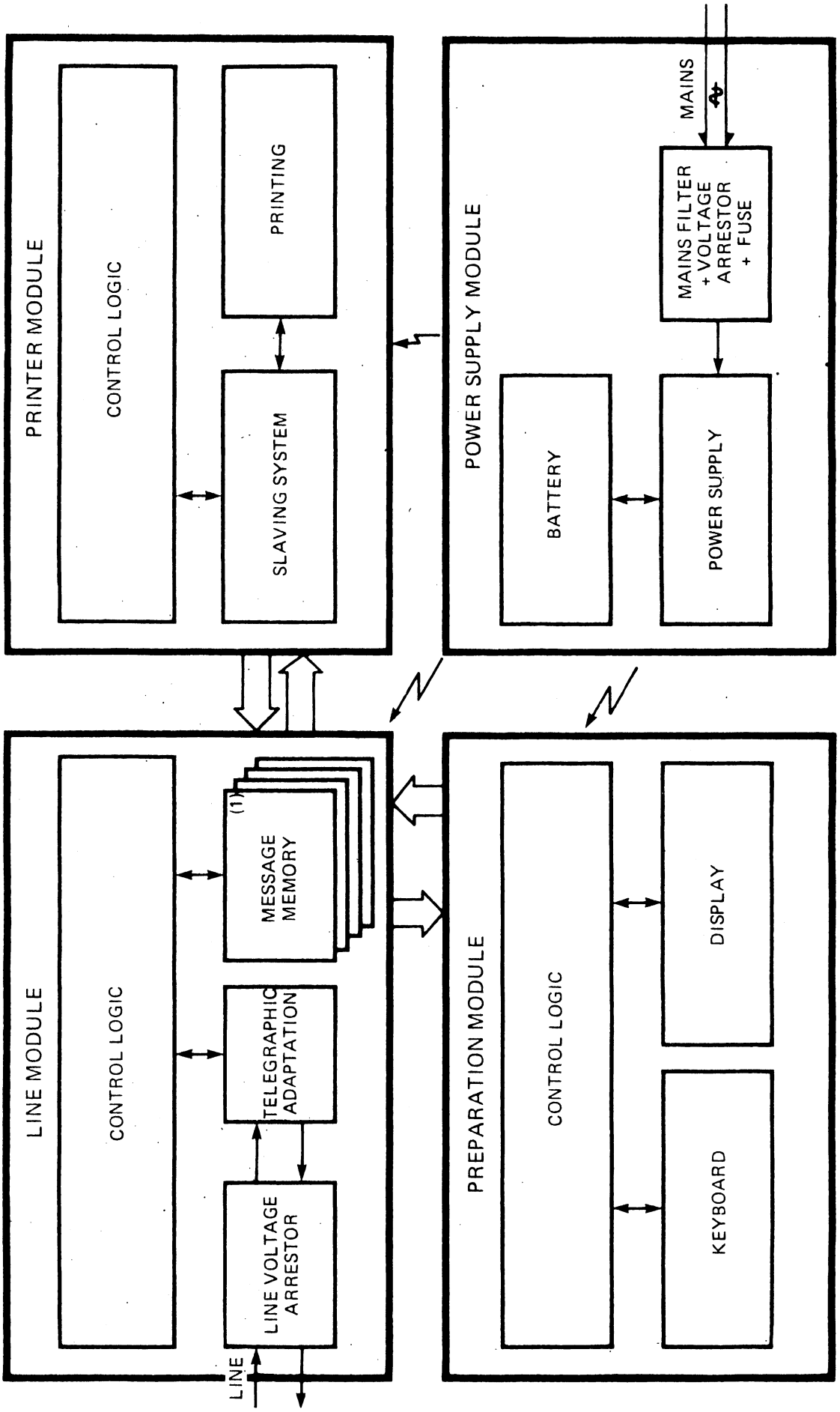
- Consumed power : 130 VA in operating mode
  : 20 VA on standby

- Dimensions
  . width : approx. 605 mm
  . length : approx. 705 mm
  . height : approx. 335 mm (in working order)

- Weight : 30 kg approx.

- Environment :
  . operating temperature : 0°C to + 45°C
  . storage temperature : - 40°C to + 70°C

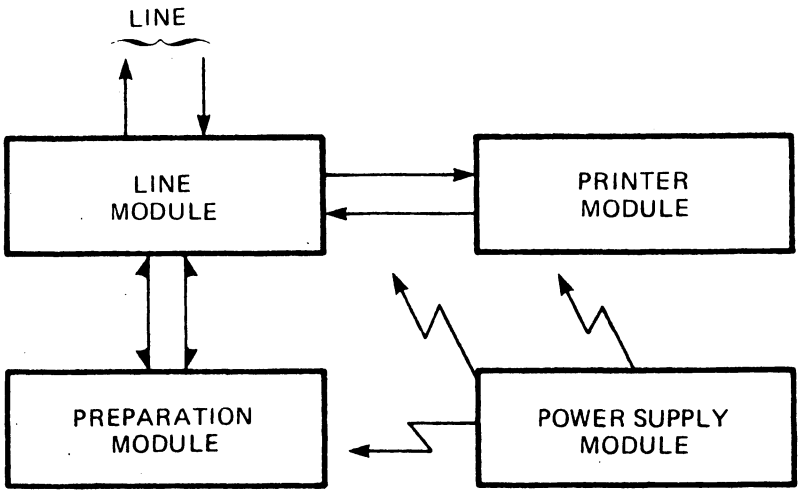
- Suppression : in accordance with standard VDE 0875 level K (conduction).



(1) 8K Bytes(and on option, 16, 32, or MAGNETIC REGISTER MEMORY operational from 70 or 140k bytes)

GENERAL LAYOUT DIAGRAM

3 GENERAL STRUCTURE



The unit is built around the following three FUNCTIONAL MODULES : (see figures above)

1 - LINE MODULE
2 - PRINTER MODULE
3 - PREPARATION MODULE

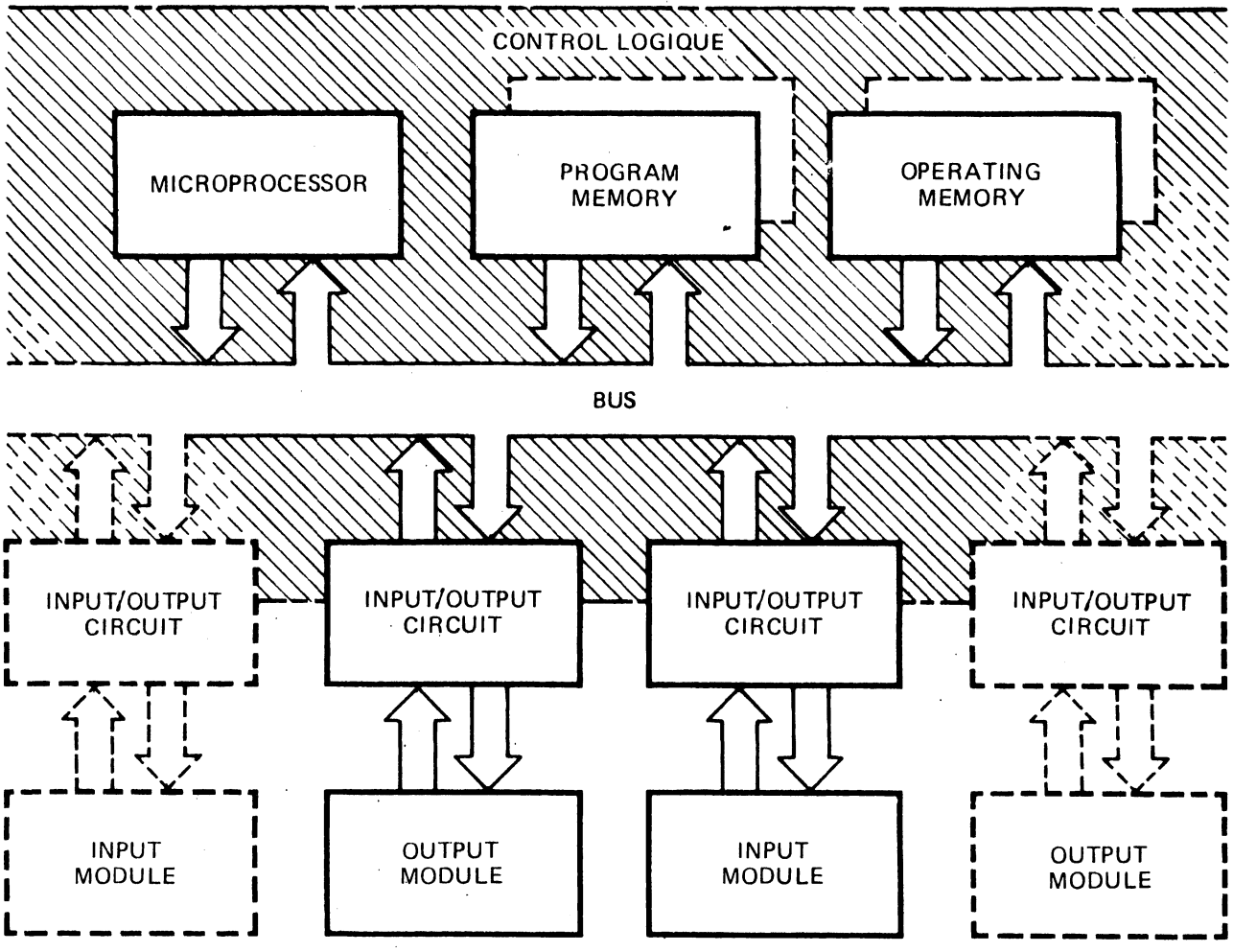
The LINE MODULE is also used for overall coordination. A POWER SUPPLY module is connected to enable operation.

Each FUNCTIONAL MODULE has its own control logic, the structure of which is identical.

The printer design is such that a maximum of functions is enabled by the electronic system.

Its breakdown is functional and modular.

The GENERAL LAYOUT DIAGRAM shows the position of the physical modules on the functional modules.



STRUCTURE OF A FUNCTIONAL MODULE

The structure of each functional module consists of :

- a microprocessor
- the associated memories (program memory and operating memory)
- the input/output circuits enabling information exchange

This system may therefore be considered as a computer system.

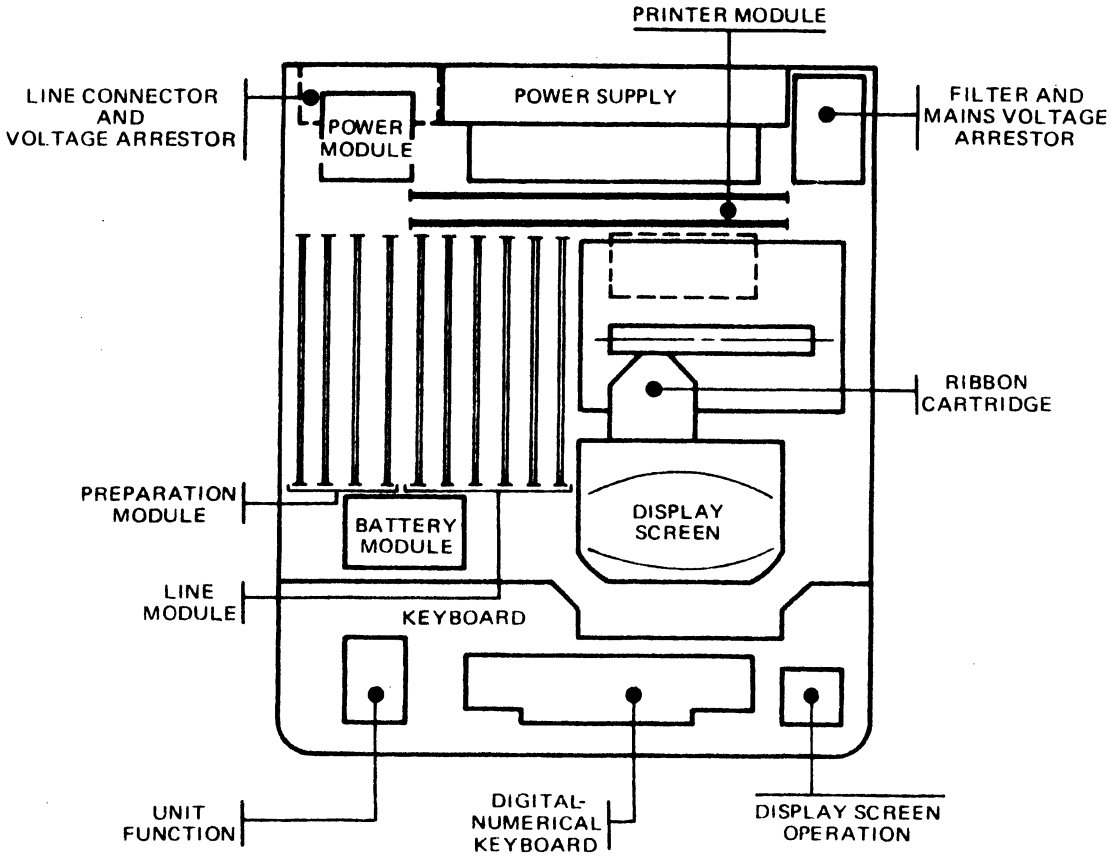
By means of the input/output circuits, this computerised structure controls a set of peripherals (input and output modules which are physical modules).

Each physical module dialogs with the BUS by means of an input/output circuit.

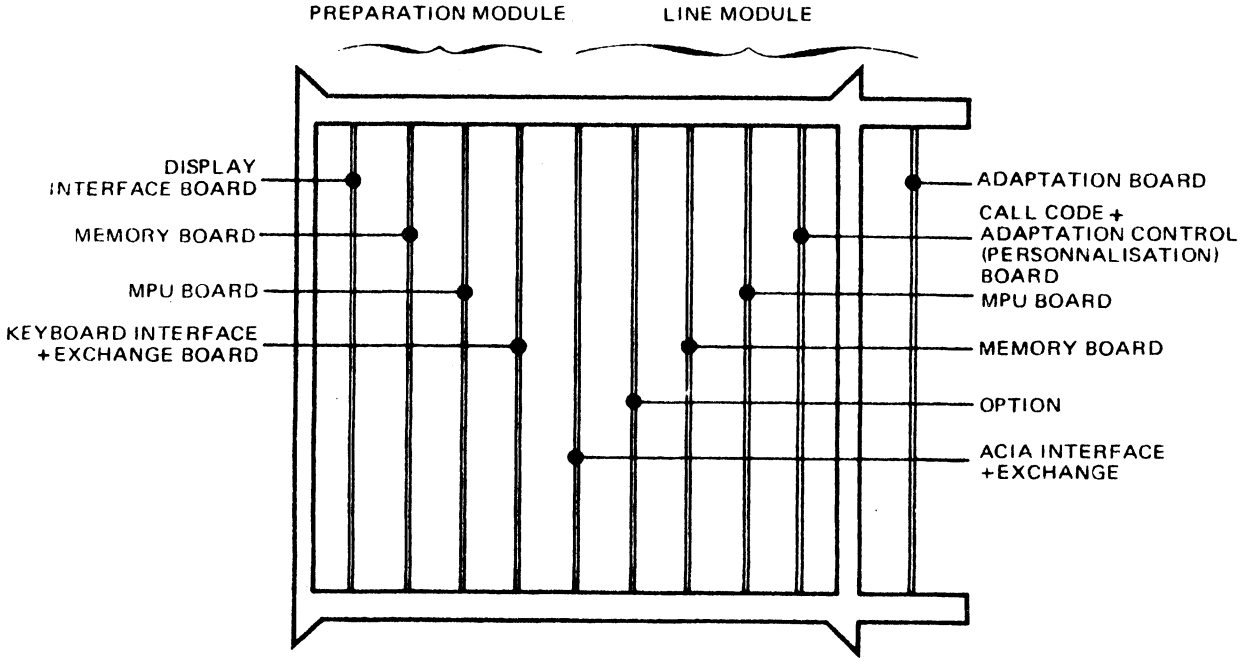
The function of the microprocessor is permanent scrutiny of the BUS state and, depending on the various states, carries out control of the sequences and data transfer between modules.

The information exchanged between the peripheral modules and the control logic consists of the following :

- status data, from the modules to the control logic
- control data, from the control logic to the modules
- data information from the input modules to the control logic and from the control logic to the output modules.



GENERAL LAYOUT



LAYOUT OF "LINE" AND "PREPARATION" ELECTRONIC BOARDS

4 COMPOSITION

4.1 COMPOSITION OF THE LINE MODULE

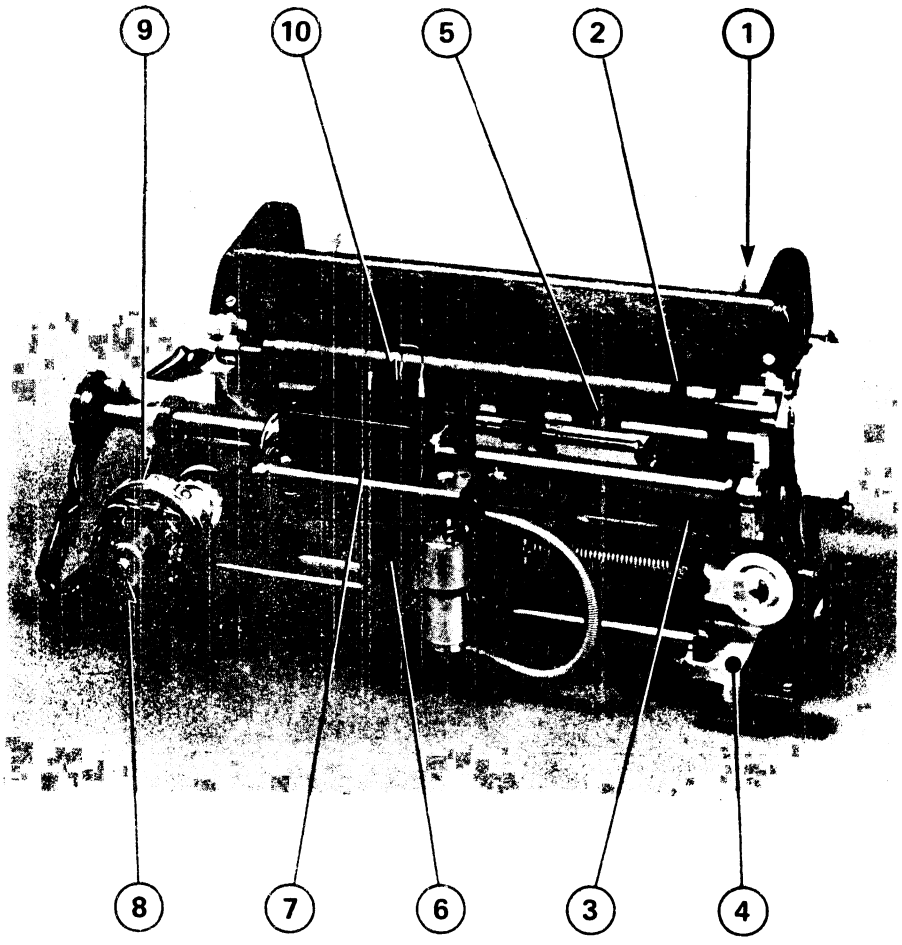
The line module comprises :

- TELEGRAPHIC ADAPTATION board
- CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board
- MPU board
- MEMORY board
- ACIA + EXCHANGE INTERFACE board
- OPTION board (eg.: additional memory
- OPERATING CONNECTION board
- LINE VOLTAGE ARRESTOR board.

4.2 COMPOSITION OF THE PREPARATION MODULE

The PREPARATION MODULE comprises :

- KEYBOARD board
- KEYBOARD INTERFACE + EXCHANGE board
- MPU board
- RAM MEMORY board
- DISPLAY SCREEN consisting of :
  - . SCREEN
  - . DISPLAY CONTROL board
- DISPLAY INTERFACE board



PRINTER CHASSIS ASSEMBLY

4.3 COMPOSITION OF THE PRINTER MODULE

The PRINTER MODULE comprises the :

- PRINTER INTERFACE board
- PRINTER MPU board
- POWER AMPLIFIER
- PRINTER CHASSIS ASSEMBLY comprised of the :

    . PAPER FEED (1)
    . ROLLER (2)
    . INTERLINE MOTOR (3)
    . CHASSIS (4)
    . PRESSURE ROLLERS (5)
    . CARRIAGE (6)
    . RIBBON CARTRIDGE (7)
    . SENSOR/CODER (8)
    . WIND-ON MOTOR (9)
    . PRINTING DEVICE (10)

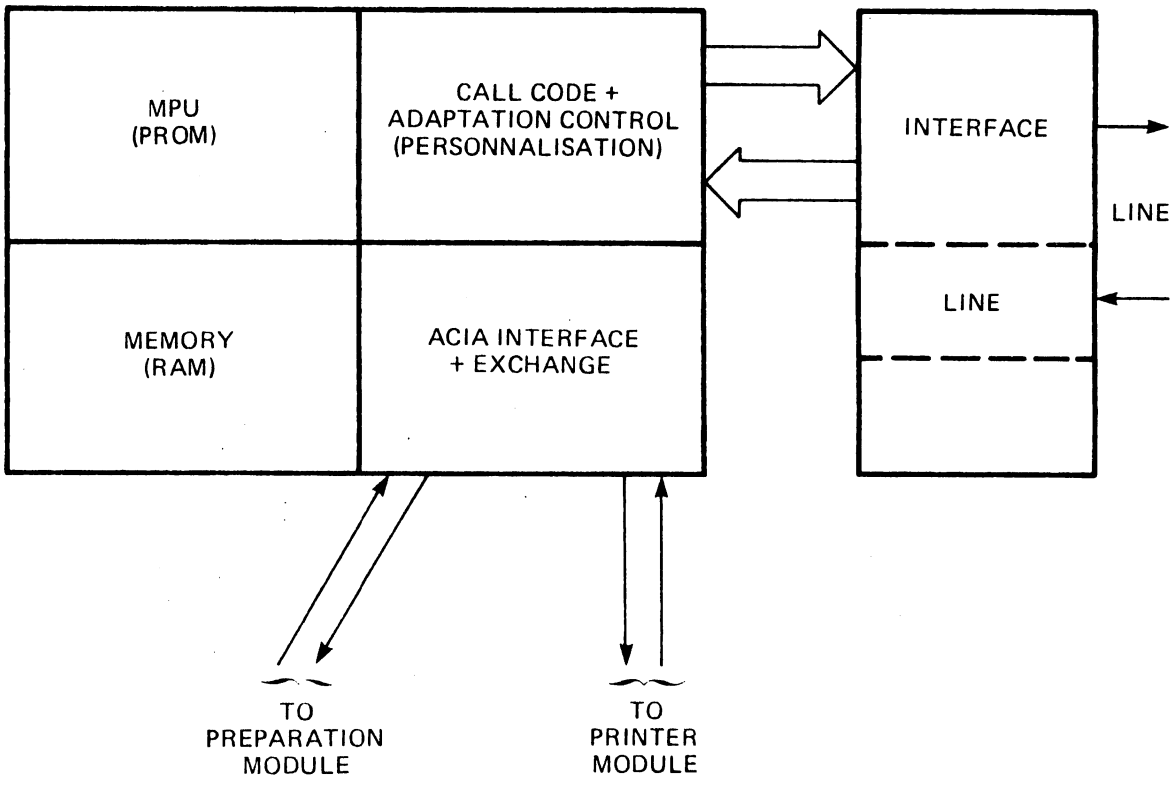
4.4 COMPOSITION OF THE POWER SUPPLY MODULE

The power supply module comprises the :

- POWER SUPPLY board
- N° 1 REGULATION board
- N° 2 REGULATION board
- MAINS FILTER
    . MAINS VOLTAGE ARRESTOR board
- BATTERY with its CHARGER and TELEGRAPH POWER SUPPLY board.

5 FUNCTIONAL DESCRIPTION

5.1 FUNCTIONAL DESCRIPTION OF THE LINE MODULE



5.1.1 General

The LINE MODULE, combined with its control logic, performs the following main functions :

- message memorisation
- call code personnalisation and control
- transmission/reception
- exchange with the other functional modules
- power supply control.

5.1.2 Message memorisation

The message memory records prepared or received texts in the RAM memories. There are two types, low or high consumption, the choice being optional.

There are one or two available locations for memory boards which offer the following choice of capacities :

- 8k bytes, or approx. 8 messages
- 14k bytes, or approx. 20 messages
- 30k bytes, or approx. 52 messages.

5.1.3 Call code personnalisation and control

The CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board enables the following in the LINE MODULE :

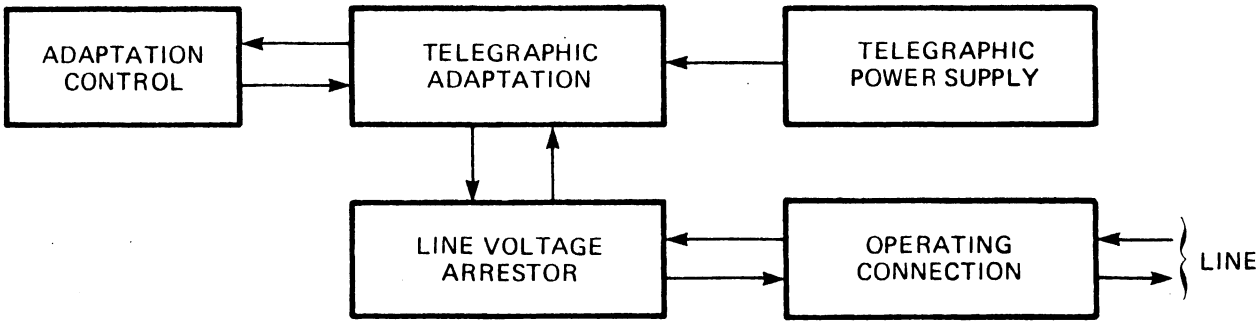
- firstly, introduction of information relating to the choice of operating parameters (see technical spec. for the board : SWITCH POSITIONING).
- secondly, transmission of the unit CALL CODE, contained in a programmable, plug-in memory. A change in CALL CODE is obtained by changing the memory.

NOTE : The call code transmitter memory is programmed using special tooling.

5.1.4 Transmission/reception

The LINE MODULE performs data transmission and reception on-line.

The LINE MODULE control logic monitors through the LINE INTERFACE, ADAPTATION CONTROL.



The LINE INTERFACE adapts the system to the electrical characteristics of the line.

The ADAPTATION and TELEGRAPHY POWER SUPPLY cut off the unit from line.

The maintenance selector switch, located on the TELEGRAPHY ADAPTATION board enables testing of the line by the network operator. In this way, the line can take on the following configurations : NORMAL*, CUT OFF, LOOPED, GROUNDED, INVERTED.

On the connector plate at the rear of the printer, there is :

. a reset to zero pushbutton enabling triggering of the AUTOTEST
. a 0/1 selector switch enabline looping of transmission onto the unit reception system in position 1 and enabling line AUTOTEST.

* TELEPRINTER or LINE.

5.1.5 Exchanges with the other Functional Modules

The LINE MODULE performs the exchanges with the PRINTER MODULE and the PREPARATION MODULE. This function is performed by the ACIA + EXCHANGE INTERFACE.

5.1.6 POWER SUPPLY MODULE control

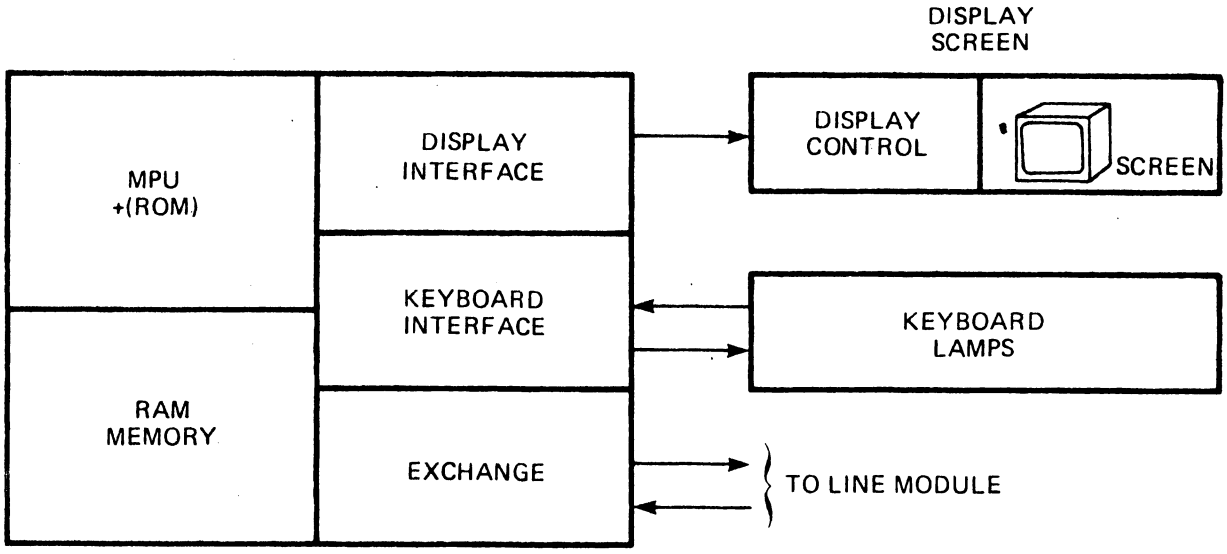
The LINE MODULE operates the STANDBY or OPERATING mode power supply.

The LINE MODULE monitors and operates the BATTERY module.

It also operates the audible warning.

These orders are given through the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

5.2 FUNCTIONAL DESCRIPTION OF THE PREPARATION MODULE



5.2.1 General

The PREPARATION MODULE carries out :

- from the KEYBOARD, introduction of the characters and orders for operation of the DISPLAY SCREEN unit
- operation of the function lamps
- and also controls the DISPLAY SCREEN.

It also enables exchange of characters with the LINE MODULE which in turn, transmits them to the PRINTER MODULE where appropriate.

5.2.2 DISPLAY INTERFACE board

The DISPLAY INTERFACE board generates a "composite signal", adapted to a DISPLAY SCREEN, from the content of the preparation memory.

5.2.3 DISPLAY SCREEN MODULE

The DISPLAY SCREEN module consists of a DISPLAY CONTROL board and a CATHODE RAY SCREEN.

The DISPLAY CONTROL board supplies all voltages and signals required by the CATHOD RAY SCREEN from the "composite signal".

5.2.4 KEYBOARD board

TELEPRINTER OPERATION

DIGITAL-NUMERIC KEYBOARD

DISPLAY SCREEN UTILISATION

When the operator presses a key, the KEYBOARD supplies the corresponding code and also the control signals.

The KEYBOARD is of the "flat" type and consists of :

- dustproof magnetic contact keys
- an indicator light
- a keyboard coder.

Many different layouts and key symbols are possible.

5.2.5 KEYBOARD + EXCHANGE INTERFACE board

The KEYBOARD INTERFACE forms the link between the KEYBOARD and the control logic.

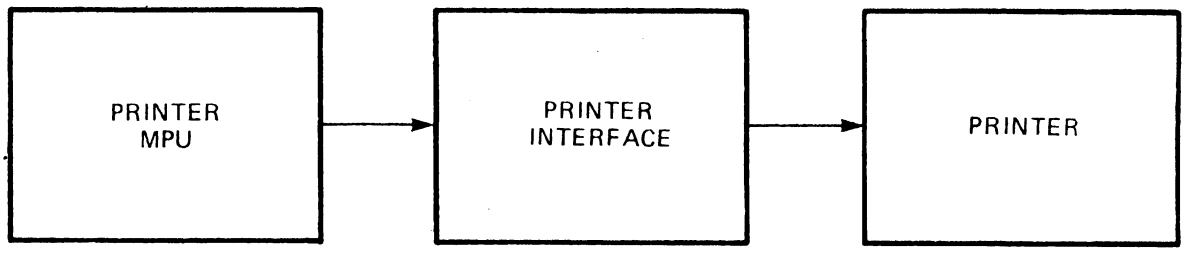
The EXCHANGE enables communication between the LINE MODULE and the PREPARATION MODULE.

5.2.6 Preparation MEMORY board

The PREPARATION MODULE MEMORY is used mainly for recording of a message during preparation, for display and the control logic.

5.3 FUNCTIONAL DESCRIPTION OF THE PRINTER MODULE

5.3.1 General



The PRINTER MODULE enables writing of messages during preparation for transmission or reception.

Three different typefaces appear on the original and on its copies :

- A locally prepared message.

  A LOCALLY PREPARED MESSAGE IS PRINTED
  IN CHARACTERS SLOPING TO THE LEFT

- A transmitted message.

  A TRANSMITTED MESSAGE IS PRINTED
  IN CHARACTERS SLOPING TO THE RIGHT

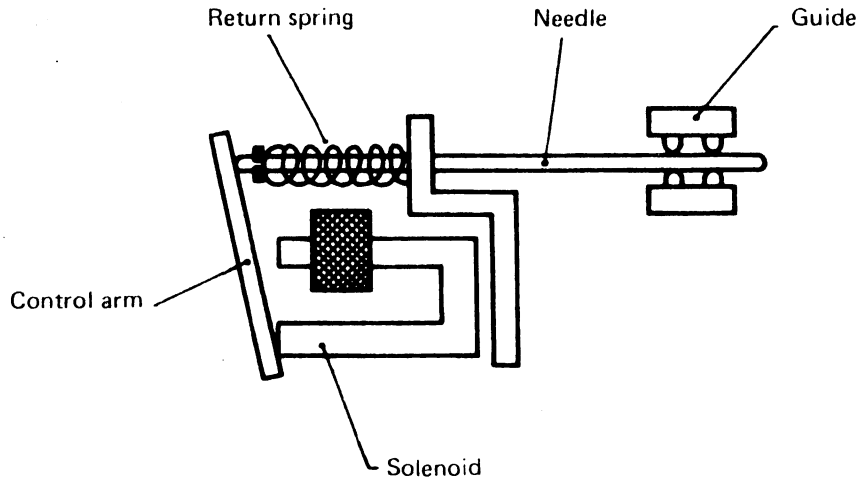
- A received message.

  A RECEIVED MESSAGE IS PRINTED
  IN UPRIGHT CHARACTERS

The PRINTER MODULE control logic order the following functions through the PRINTER INTERFACE board :

- printing
- CARRIAGE advance and return
- interline
- inking

5.3.2 Printing



Printing is by means of a mosaic type character definition of 7 lines and (5 + 4) columns. A set of points enables reconstitution of the characters.

Printing is by impact, with an inking ribbon.

The PRINTING DEVICE comprises :

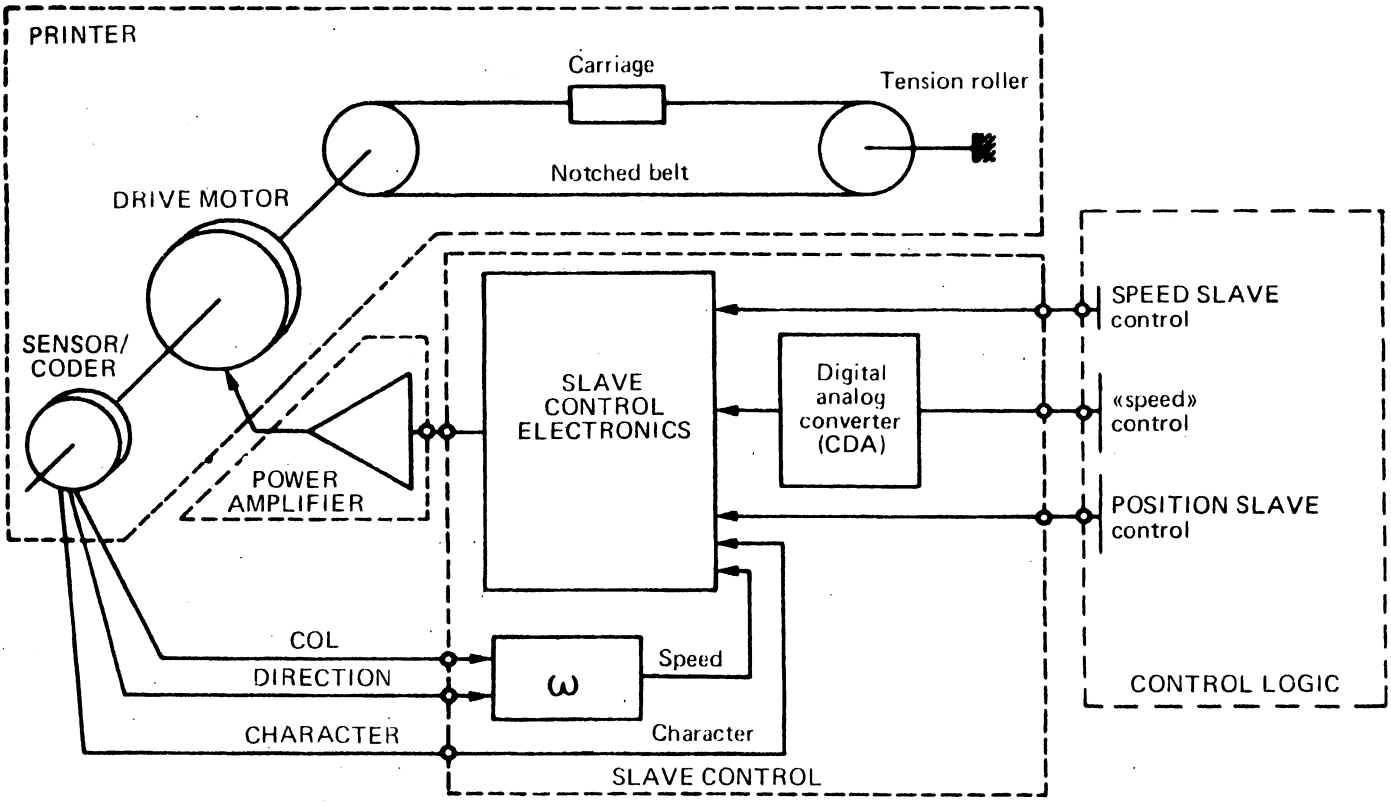
- 7 needles
- 7 control arm solenoids.

An appropriate control sequence enables printing of the character column by column, during passage of the printing device over the paper.

The needles are returned by a spring and guided at the end of the printing device system.

Depending on the number of copies or the thickness of the paper, the PRINTING DEVICE position may be adjusted by means of a thumbwheel.

5.3.3 Carriage advance and return



- the printing and the inking devices are mounted on a carriage guided along two rails.

- DRIVE MOTOR :

  The carriage advance and return to the start of the line is by means of a DC motor slaved to a SENSOR/CODER. The DRIVE MOTOR movement is transmitted to the CARRIAGE by two pullies and a notched belt. The CARRIAGE is attached to the notched belt.

- SENSOR/CODER is connected mechanically to the DRIVE MOTOR shaft. It supplies the signals for :

  . the movement direction
  . movement speed
  . carriage position.

The slave system corrects the orders given from the previous signals so that the carriage movements conform to the pre-established profiles.

5.3.4 Line spacing

The paper drive is of the friction type.

The type is applied to the PRINTING ROLLER by PRESSURE ROLLERS.

The PRINTING ROLLER rotation is by a step-by-step motor.

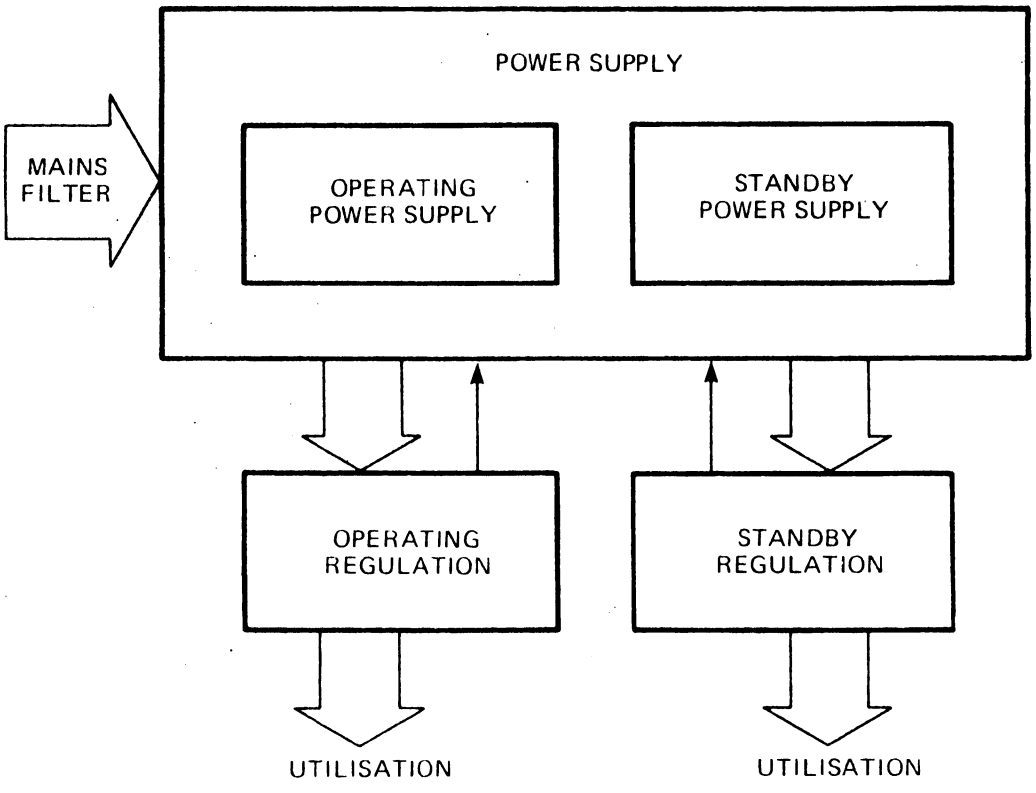
In addition, when printing is finished, the text is released from the PRINTING DEVICE, enabling it to be read.

5.3.5 Inking

A closed loop inking ribbon in a RIBBON CARTRIDGE is fed in front of the PRINTING DEVICE.

A fixed notched belt located parallel to the CARRIAGE movement drives the ribbon (forwards) by a notched wheel.

5.4 FUNCTIONAL DESCRIPTION OF THE POWER SUPPLY MODULE

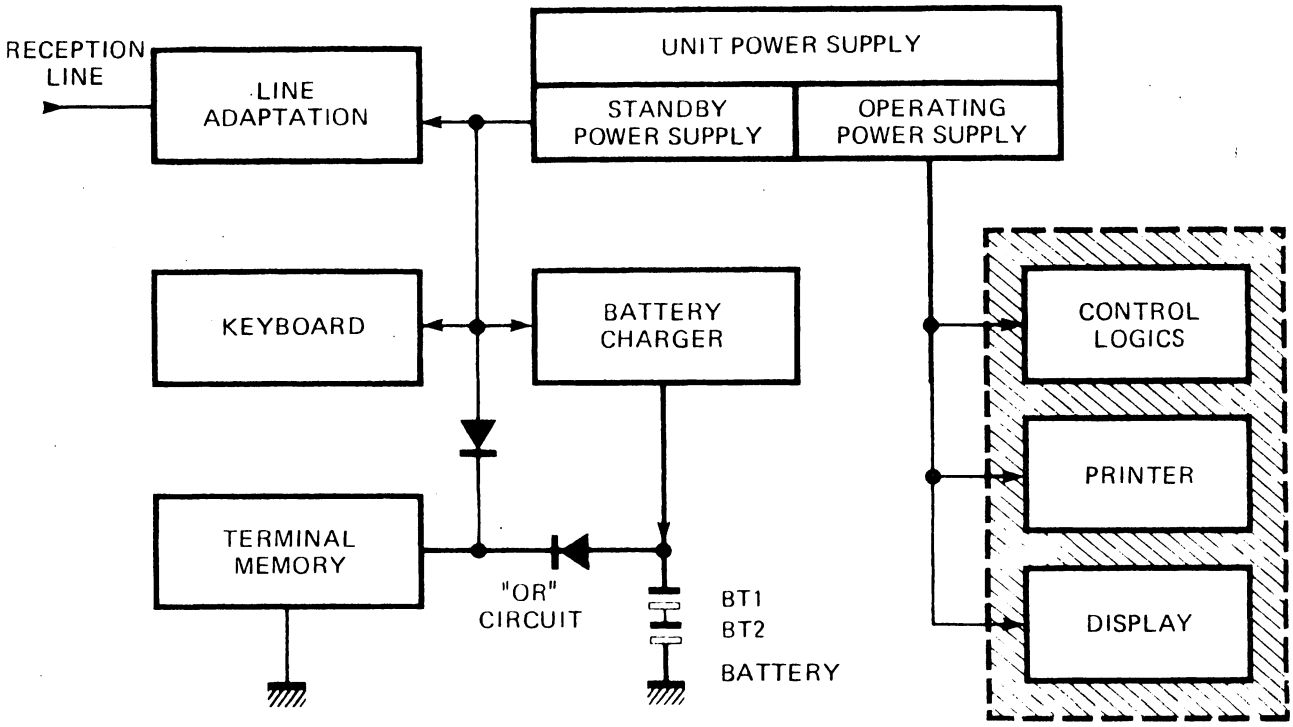


The POWER SUPPLY MODULE supplies the electrical power required for all parts of the unit from the mains.

The module is a dual system. It has two cut-out power supplies.

After a few minutes, if the unit is not used, but is energised, it automatically switches over to STANDBY which considerably reduces its electricity consumption.

In the STANDBY mode, the RECEPTION of a signal, or LOCAL UTILISATION immediately and automatically starts up the unit.

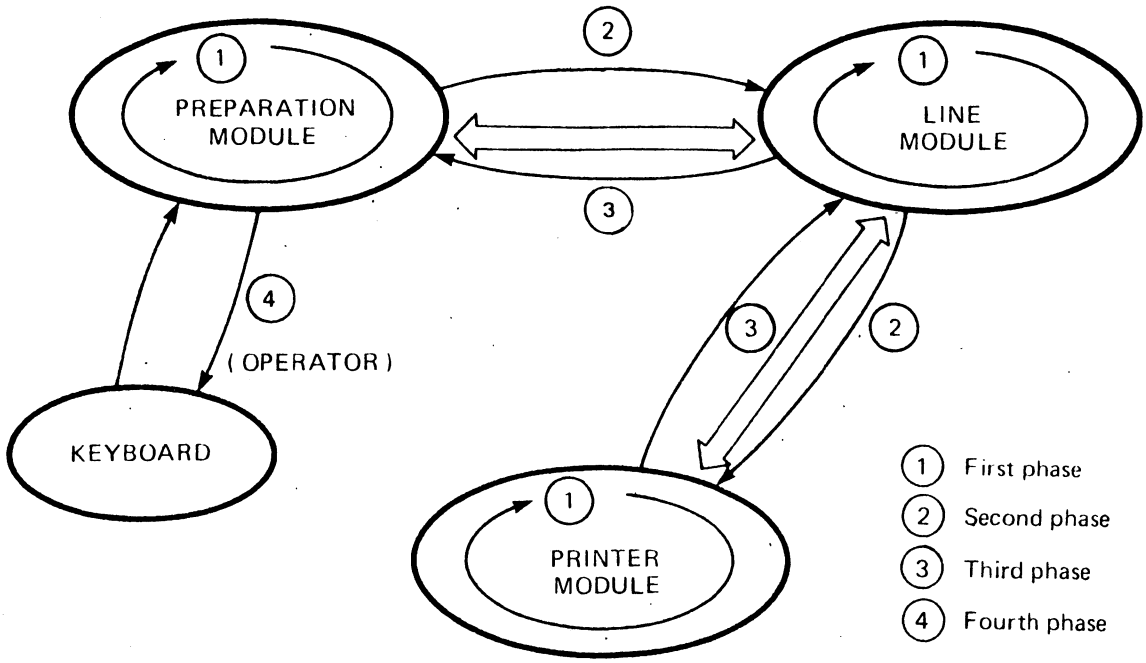


In addition, in case of a mains cut-off, there is a device enabling protection of the information stored in the teleprinter memory lasting for one hour approximately (100 hours optional).

While the unit is fed by the mains, a battery charger charges the battery (fully charged in 100 hours).

If there is a mains cut-off, the battery supplies the memory storing the information.

6 AUTOTEST DEVICE



This device enables CHECKING FOR CORRECT OPERATION of the unit when starting up and also when required by the maintenance operative.

Any anomaly is notified by the display screen, the keyboard lamps or the printer.

The autotest is in four phases :

- the first phase, the autotest for each of the LINE PREPARATION and PRINTER MODULES is performed simultaneously.
- the second phase, the PREPARATION and LINE MODULES and the LINE and PRINTER MODULES try to dialog.
- the third phase, the LINE MODULE transmits date to the PREPARATION and PRINTER MODULES and reciprocally.
- the fourth phase, the operator may test the KEYBOARD, with the code pertaining to each key being displayed after it is pressed.

NOTE : setting off of the autotest erases the memories.

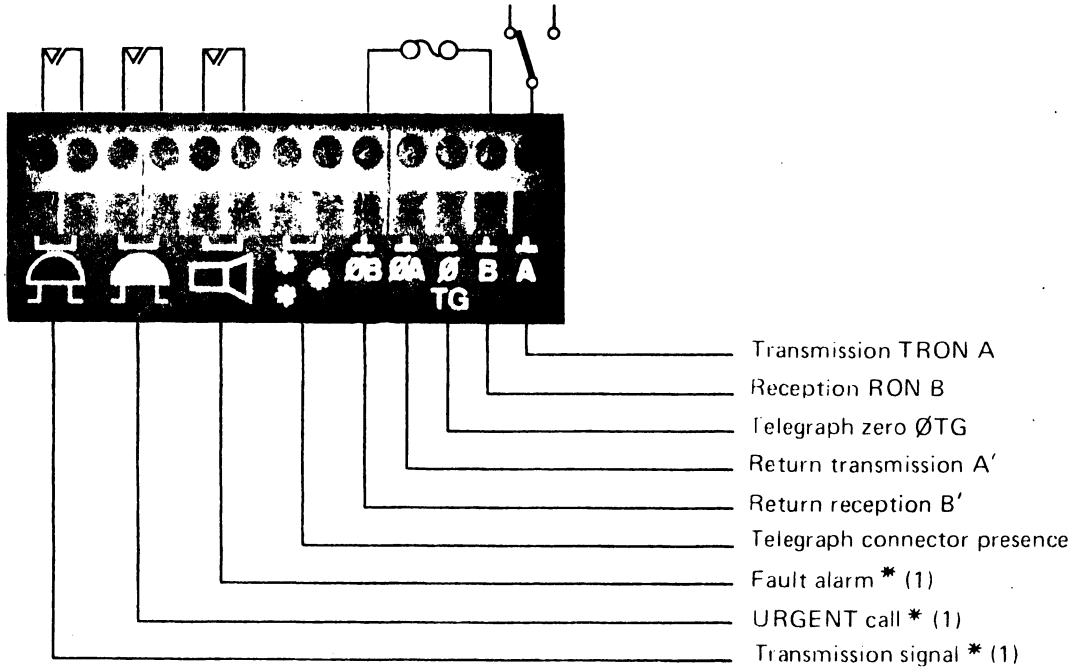
7 TELEPRINTER CONNECTION

7.1 MAINS CONNECTION

The unit is fitted with a mains cable for connection to the mains.

7.2 TRANSMISSION LINE CONNECTION

The unit is equipped with a line bar.



(1) These functions may be indicated by luminous, audible, etc., devices located on the outside of the machine. The relay contact whose characteristics are given below, are accessible on the line bar :

- maximum voltage : 100 V
- maximum intensity : 250 mA
- maximum cut-out power : 10 W
- contact resistance : < 150 m

Connection is at the rear of the unit. Refer to the technical specification sheets for :

- CONNECTIONS
- POSITIONING OF SWITCHES for the type of ADAPTATION board used.

* this function may differ, depending on the type of unit.

8 STARTING UP THE TELEPRINTER

With the teleprinter correctly connected up, turn on the START switch. The lamp comes on and the autotest is triggered off.

When the autotest is finished, the unit is ready for use.

NOTE : refer to the technical specification sheets for selection of operating parameters.

- CONNECTION
- POSITIONING OF THE SWITCHES ON BOARDS :
  - . CALL CODE + ADAPTATION CONTROL (PERSONNALISATION)
  - . ADAPTATION.

2

MAINTENANCE MANUAL

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P L A T E S

PLATE 1 - LAYOUT N° 23 110 760 - 8

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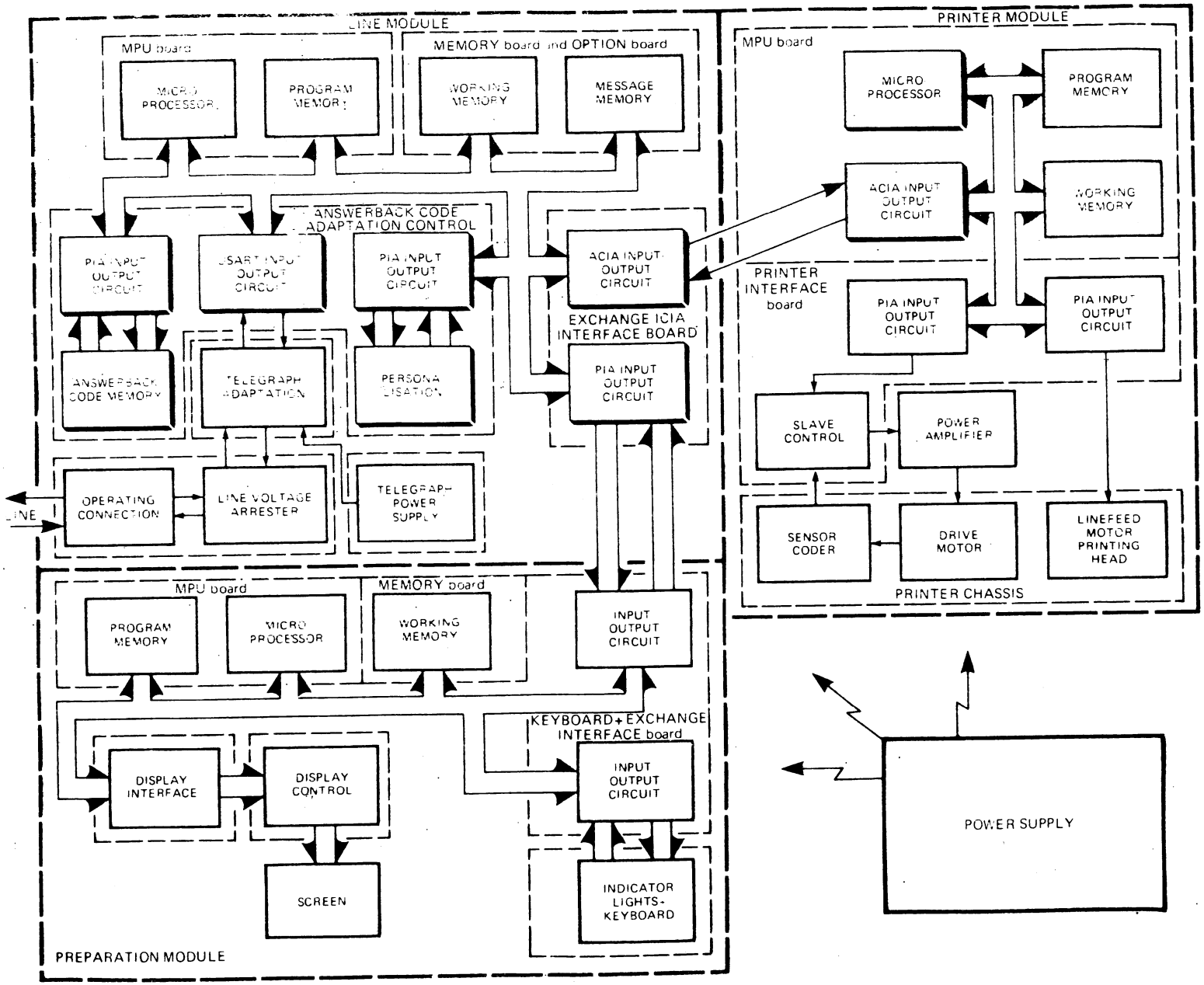

LINE MODULE
MPU board
MICRO PROCESSOR
PROGRAM MEMORY
MEMORY board and OPTION board
WORKING MEMORY
MESSAGE MEMORY
ANSWERBACK CODE ADAPTATION CONTROL
PIA INPUT OUTPUT CIRCUIT
USART INPUT OUTPUT CIRCUIT
PIA INPUT OUTPUT CIRCUIT
ACIA INPUT OUTPUT CIRCUIT
EXCHANGE ICIA INTERFACE BOARD
ANSWERBACK CODE MEMORY
TELEGRAPH ADAPTATION
PERSONALISATION
PIA INPUT OUTPUT CIRCUIT
OPERATING CONNECTION
LINE VOLTAGE ARRESTER
TELEGRAPH POWER SUPPLY
LINE
PRINTER MODULE
MPU board
MICRO PROCESSOR
PROGRAM MEMORY
ACIA INPUT OUTPUT CIRCUIT
WORKING MEMORY
PRINTER INTERFACE board
PIA INPUT OUTPUT CIRCUIT
PIA INPUT OUTPUT CIRCUIT
SLAVE CONTROL
POWER AMPLIFIER
SENSOR CODER
DRIVE MOTOR
LINEFEED MOTOR PRINTING HEAD
PRINTER CHASSIS
MPU board
PROGRAM MEMORY
MICRO PROCESSOR
MEMORY board
WORKING MEMORY
INPUT OUTPUT CIRCUIT
KEYBOARD+EXCHANGE INTERFACE board
DISPLAY INTERFACE
DISPLAY CONTROL
INPUT OUTPUT CIRCUIT
SCREEN
INDICATOR LIGHTS-KEYBOARD
PREPARATION MODULE
POWER SUPPLY

2 GENERAL

This MAINTENANCE GUIDE is designed to aid the technician on the operating location.

Each function may use several of the machine constituent modules.

The procedure is as follows :

- trip the SELF-TEST,
- check for any faulty function,
- check for faulty modules,
- replace them by following the instructions given in the MODULE REMOVAL AND INSTALLATION chapter,
- check correct operation using the SELF-TEST, before TURNING THE UNIT BACK ON.

3 SELF-TEST

3.1 PRELIMINARY OPERATIONS

Before setting off the self-test :

- printing out of the message memory content (if possible),
- checking :
  . that the boards are correctly plugged in,
  . that the cords are properly connected.
- putting the O/1 selector switch on 1,
- CARRIAGE travel to the right, to the end of the line,
- checking of paper supply.

3.2 SETTING OF THE SELF-TEST

Press the "RAZ" (RESET) button on the back of the unit. The unit reacts in the following manner when operation is correct :

- the printer starts up (the carriage goes to the left stop),
- the "display screen" is activated (the screen is filled with □'s),
- the indicator lights come on for 1 second,
- the following results are displayed and printed in the following order:
  . reference number of software corresponding to each of the PRINTER, PREPARATION and LINE MODULES,
  . character check phrase (simple line of upright writing is displayed),
  . checking of "site" options (choice of operating parameters, using the ANSWERBACK CODE + ADAPTATION order board (PERSONNALISATION),
  . the machine answerback code,
  . line test *.

- when testing the KEYBOARD,pressing a key results in the display of the corresponding code, and preceded, where applicable, by the relevant symbol.

See examples of displayed and printed information, and also key coding, in the following pages.

*If the ADAPTATION board has the "with ground feedback" option.

3.3 DISPLAYED INFORMATION

DISPLAY SELF-TEST FINISHED

PRINTER MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
PREPARATION MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
LINE MODULE..... : TESTS FINISHED-PROGRAM : 23 .....

DISPLAY TEST

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890%ÉH♣'()+,-./:=?

SITE OPTIONS

ANSWERBACK CODE :

LINE TEST

YRYRYRYRYRYRYRYRYRYRYRY.....RYRY (69 characters)
RYRYRYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRY.....Y
RYRYRYRYRYRY.....Y
YRYRYRYRYRY.....Y
RYRYRYRYRY.....Y
YRYRYRYRY.....Y
RYRYRYRY.....Y
YRYRYRY.....Y
.....
.....
.....
RYRY
YRY
RY
Y

KEYBOARD TEST (for example : press key A)

0 1 1 0 0 0 0 1

3.4 PRINTED INFORMATION

PRINTED MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
PREPARATION MODULE.... : TESTS FINISHED-PROGRAM : 23 .....
LINE MODULE..... : TESTS FINISHED-PROGRAM : 23 .....

PRINTED TEST :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH (characters sloping to left)
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH'()+,-./:=? (characters upright)
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH'()+,-./:=? (characters sloping to right)

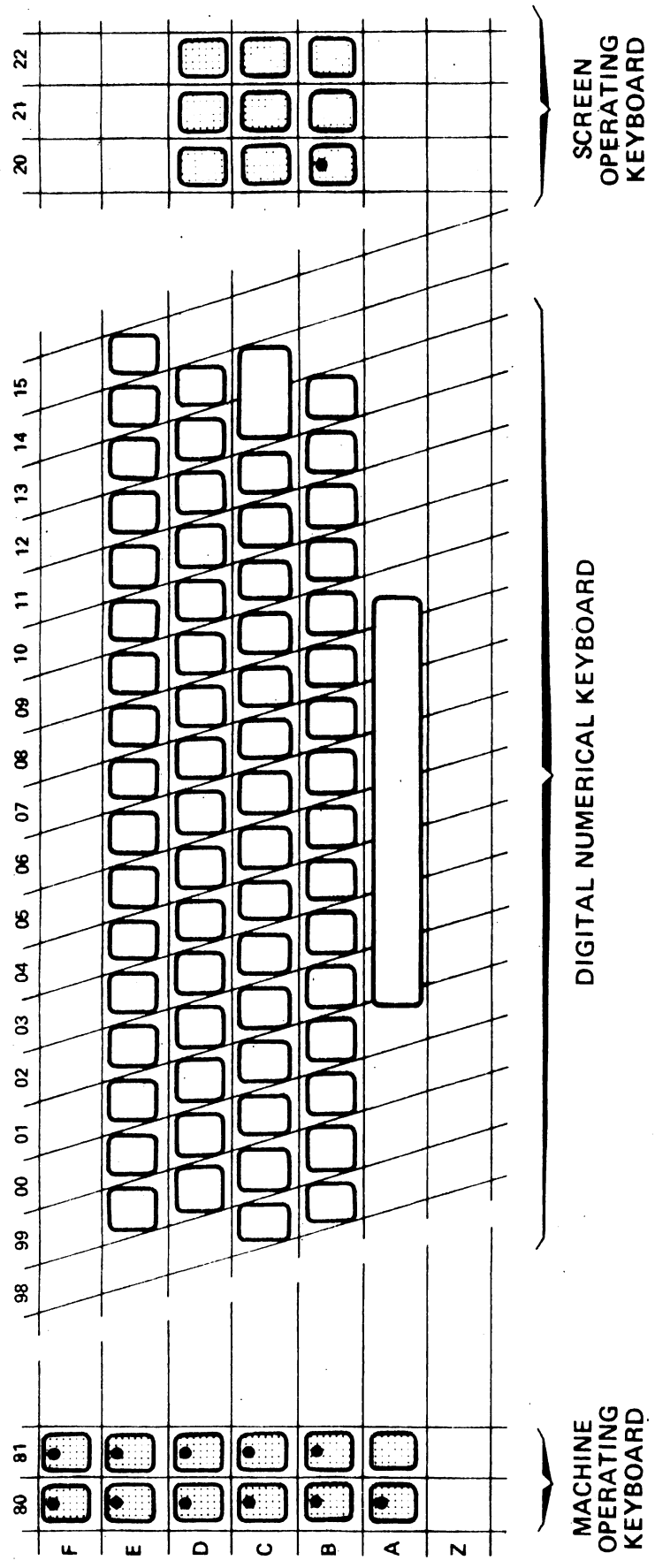
SITE OPTIONS : 00000000

ANSWERBACK CODE : SAGEM TX35

LINE TEST ..... :

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR
YRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR
RYR

3.5 KEY ARRANGEMENT



3.6 KEY CODING

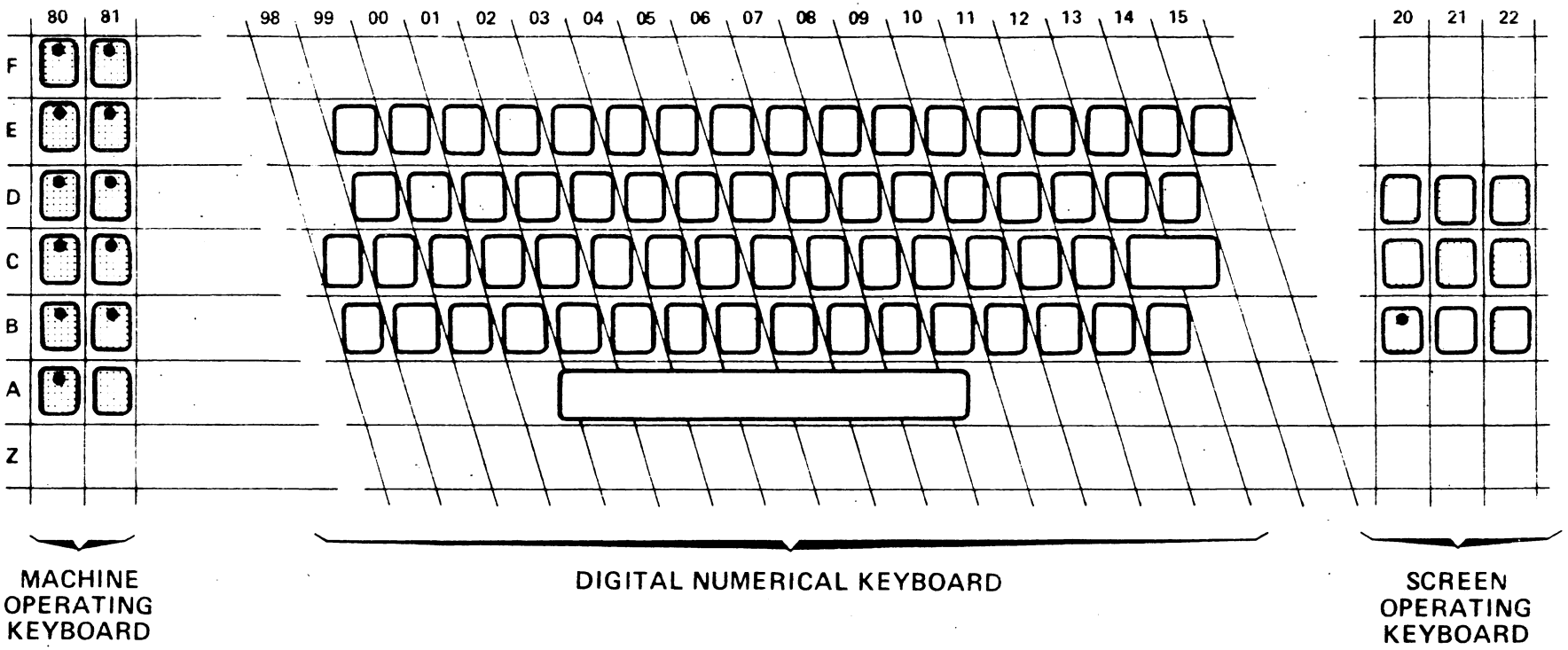
3.6.1 Digital numerical keyboard

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
A02 to 08	1	0	1	1	1	0	1	0
B 98	1	0	1	0	1	1	1	0
B 99	1	0	1	1	1	0	0	0
B 00	1	0	1	0	1	0	1	1
B 01	1	0	1	1	0	1	0	1
B 02	1	0	1	0	1	0	1	0
B 03	1	0	1	1	0	1	0	0
B 04	1	0	1	0	1	0	0	1
B 05	1	0	1	1	0	0	1	1
B 06	1	0	1	0	1	0	0	0
B 07	1	0	1	1	0	0	1	0
B 08	1	0	1	0	1	1	0	0
B 09	1	0	1	1	0	1	1	0
B 10	1	0	1	0	1	1	0	1
B 11	1	0	1	1	0	1	1	1
B 12	1	0	1	0	1	1	1	1
B 13	1	0	1	1	1	0	0	1

COORDINATES OF KEY PRESSED	CODE FO KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
C 98	1	0	0	1	1	0	1	0
C 99	1	0	1	0	0	1	0	0
C 00	1	0	0	1	0	1	1	1
C 01	1	0	1	0	0	0	0	1
C 02	1	0	0	1	0	1	1	0
C 03	1	0	1	0	0	0	0	0
C 04	1	0	0	1	0	1	0	1
C 05	1	0	0	1	1	1	1	1
C 06	1	0	0	1	0	1	0	0
C 07	1	0	0	1	1	1	1	0
C 08	1	0	0	1	1	0	0	0
C 09	1	0	1	0	0	0	1	0
C 10	1	0	0	1	1	0	0	1
C 11	1	0	1	0	0	0	1	1
C 12	1	0	0	1	1	0	1	1
C13 and C14	1	0	1	0	0	1	0	1

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
D 99	1	0	0	0	0	1	1	1
D 00	1	0	0	1	0	0	0	1
D 01	1	0	0	0	0	1	1	0
D 02	1	0	0	1	0	0	0	0
D 03	1	0	0	0	0	1	0	1
D 04	1	0	0	0	1	1	1	1
D 05	1	0	0	0	0	1	0	0
D 06	1	0	0	0	1	1	1	0
D 07	1	0	0	0	0	0	0	0
D 08	1	0	0	0	1	0	1	0
D 09	1	0	0	0	0	0	0	1
D 10	1	0	0	0	1	0	1	1
D 11	1	0	0	0	0	0	1	0
D 12	1	0	0	0	1	1	0	0
D 13	1	0	0	0	0	0	1	1
D 14	1	0	0	0	1	1	0	1

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
E 99	1	1	0	0	0	0	1	1
E 00	1	1	0	0	1	1	0	1
E 01	1	1	0	0	0	0	1	0
E 02	1	1	0	0	1	1	0	0
E 03	1	1	0	0	0	0	0	1
E 04	1	1	0	0	1	0	1	1
E 05	1	1	0	0	0	0	0	0
E 06	1	1	0	0	1	0	1	0
E 07	1	0	1	1	1	1	0	0
E 08	1	1	0	0	0	1	1	0
E 09	1	0	1	1	1	1	0	1
E 10	1	1	0	0	0	1	1	1
E 11	1	0	1	1	1	1	1	0
E 12	1	1	0	0	1	0	0	0
E 13	1	0	1	1	1	1	1	1
E 14	1	1	0	0	1	0	0	1
E 15	1	1	0	0	1	1	1	0



INDICATOR LIGHT KEYS

3.6.2 Machine operating keyboard

	CODE OF KEY PRESSED							
COORDINATES OF KEY PRESSED	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
A 80	1	0	1	1	0	0	0	1
A 81	1	0	1	1	1	0	1	1
B 80	1	1	0	1	1	0	0	0
B 81	1	1	0	1	1	0	0	1
C 80	1	1	0	1	0	1	1	0
C 81	1	1	0	1	0	1	1	1
D 80	1	1	0	1	0	1	0	0
D 81	1	1	0	1	0	1	0	1
E 80	1	1	0	1	0	0	0	1
E 81	1	1	0	1	0	0	0	0
F 80	1	1	0	1	0	0	1	1
F 81	1	1	0	1	0	0	1	0

3.6.3 Screen operating keyboard

	CODE OF KEY PRESSED							
COORDINATES OF KEY PRESSED	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
B 20	1	0	1	1	0	0	0	0
B 21	1	0	1	0	0	1	1	1
B 22	1	0	0	1	0	0	1	1
C 20	1	0	0	1	1	1	0	0
C 21	1	0	1	0	0	1	1	0
C 22	1	0	0	1	1	1	0	1
D 20	1	0	0	0	1	0	0	0
D 21	1	0	0	1	0	0	1	0
D 22	1	0	0	0	1	0	0	1

3.7 BATTERY TEST

Proceed as follows :

- prepare a message,
- disconnect the mains,
- reconnect the mains cord,
- repeat the previously prepared message,
- compare the results which should be identical, if not, the battery is faulty.

3.8 UTILISATION OF THE SELF-TEST

- put the O/1 switch * on to O,
- with the machine power on, does the "ON" light come on ?
  . IF NOT : check the fuse and if the fault persists, refer to POWER SUPPLY.
- start the self-test by pressing the reset to zero button *,
- does the PRINTER DEVICE return to the left stop ?
  . IF NOT : put the ON/OFF switch onto OFF and check the pressure required on the thumbwheel needed to wind on the paper. Repeat the operation with the switch on "ON". If the POWER SUPPLY is operational, tightness should be felt when turning the thumbwheel.
    . IF NOT : change the POWER SUPPLY, does the fault persist ?
      . IF YES : change the MASTER board and check the wiring.
- do all the lights of the OPERATING KEYBOARD come on for 1 second ?
  . IF NOT : are they all off,
    . IF YES : see PREPARATION MODULE,
    . IF NOT : change the lights or the KEYBOQRD INTERFACE board.

* Located to the rear of the machine

- does the DISPLAY SCREEN display the DISPLAY SELF-TEST FINISHED?

  . IF NOT : does the alarm sound?

    . IF YES : see PREPARATION MODULE
    . IF NOT : change the DISPLAY INTERFACE board then the DISPLAY CONTROL board.

- does the alarm sound, do the ADAPTATION* board lights come on and the SCREEN flash?

  . IF YES : see LINE MODULE.

- is the printed information correct?

  . IF NOT : see PRINTER MODULE.

- see NETWORK CONNECTION

* On certain types of ADAPTATION boards.

3.9 PREPARATION MODULE

- do the lights in the first row* come on?
  - . IF YES : change the MEMORY board
  - . IF NOT : do the lights in the 2nd row come on?
    - . IF YES : change the MPU board
    - . IF NOT : do the 3rd row lights come on?
      - . IF YES : change the DISPLAY CONTROL board.
        Does the fault persist?
        - . IF YES : change the DISPLAY INTERFACE board.
      - . IF NOT : do the 4th row lights come on?
        - . IF YES : change the KEYBOARD + EXCHANGE INTERFACE board.

- has a MODULE been replaced?
  - . IF YES : repeat self-test.

* 1st row :
The upper OPERATING KEYBOARD row of the machine when sitting in the operator's seat.

3.10 LINE MODULE

- is there ONE pulse per pulse train ?
  - . IF YES : change the MPU board* of the LINE MODULE
  - . IF NOT : are there TWO pulses per train?
    - . IF YES : change the MEMORY board*
    - . IF NOT : are there THREE pulses per train?
      - . IF YES : change the second optional MEMORY board*
      - . IF NOT : are there FOUR pulses per train?
        - . IF YES : change the ANSWERBACK CODE* + ADAPTATION (PERSONALISATION) board
        - . IF NOT : are there FIVE pulses per train?
          - . IF YES : change the ACIA + EXCHANGE INTERFACE board
          - . IF NOT : are there SIX pulses per train?
            - . IF YES : change the ADAPTATION board
            - . IF NOT : change the MASTER board and check:
              - the OPERATING CONNECTING board
              - the TELEGRAPH POWER SUPPLY.

- had a MODULE been replaced?
  - . IF YES : repeat the self-test.

* Equipped with suitable memory circuits.

3.11 PRINTER MODULE

- are all of the PRINTER functions faulty?
  - . IF YES : change the MPU board, then the PRINTER INTERFACE if the fault persists.
  - . IF NOT : is there a writing fault?
    - . IF YES : change the PRINTER INTERFACE board, then the PRINTER DEVICE if the fault persists.
    - . IF NOT : is there a linefeed fault?
      - . IF YES : change the PRINTER INTERFACE board and then the LINEFEED MOTOR if the fault persists
      - . IF NOT : is there a CARRIAGE advance and return fault?
        - . IF YES : change the PRINTER INTERFACE board and if the fault persists, change:
          - . the POWER AMPLIFIER, then
          - . the FEED MOTOR, and after further test
          - . the SENSOR/CODER
        - . IF NOT : another fault?
          - . IF YES : check the wiring and if necessary, change the MASTER board.

- has a MODULE been replaced?
  - . IF YES : repeat the self-test.

3.12 POWER SUPPLY MODULE

- when turning on the power, does the fuse blow or the cut-off switch cut off?
  . IF YES : put the switch on "OFF" and
  disconnect the following electromechanical modules :
  . PRINTED DEVICE
  . LINEFEED MOTOR
  . ADVANCE MOTOR and POWER AMPLIFIER.

- put the switch back to "ON", does the cut-off switch cut off?
  . IF YES : put to the switch onto "OFF",
  remove a board,
  put the switch to "ON".

- does the cut-off switch cut off?
  . IF YES : put the switch of "OFF",
  replace the previous board,
  remove the next board,
  put the switch on "ON", etc. and so on until the faulty board is found.

  BEFORE REPLACING THE NEW BOARD, TEST THE ELECTROMECHANICAL MODULE CONTROLLED BY THIS BOARD WITH AN OHMMETER.

- change the fault MODULE
  . IF NOT : reconnect the modules one by one, change the module causing cut-out.

3.13 CONNECTION TO NETWORK

After carrying out the self-test, connect to network (the ANSWERBACK CODE memory must be programmed).

END OF SELF-TEST.

4 REMOVAL AND INSTALLATION OF MODULES

When removal of a module requires one of the operations already described above, we simply mention the title of the paragraph describing the operation.

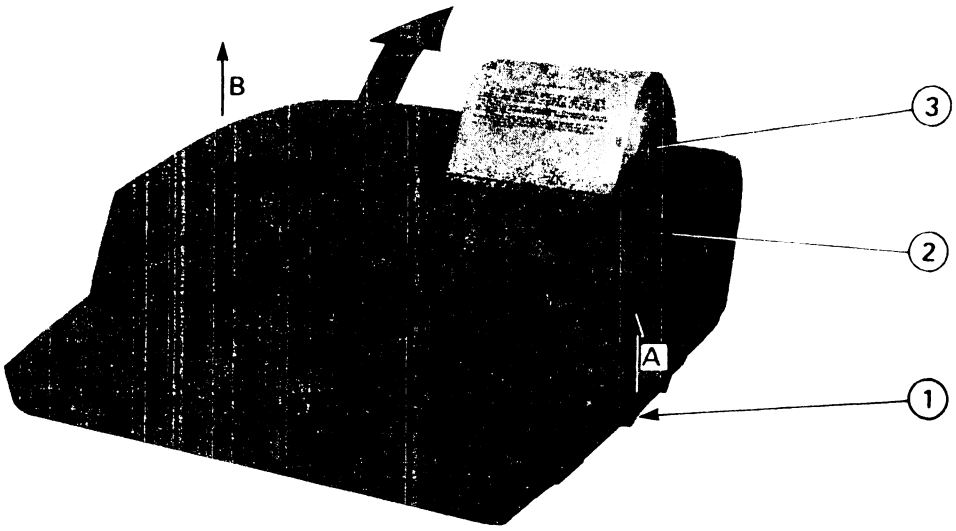
IMPORTANT : - never loosen the painted screws.

- disconnect the mains cord before working on the machine.

4.1 LIST OF TOOLING

- M3 hexagonal socket head screwdriver
- flat screwdriver, 5mm diameter
- 5.5mm pipe spanner
- blunt-ended 0.5mm feeler gauge
- tooling block No. 23 106 769-3.

4.2 MAINTENANCE COVER



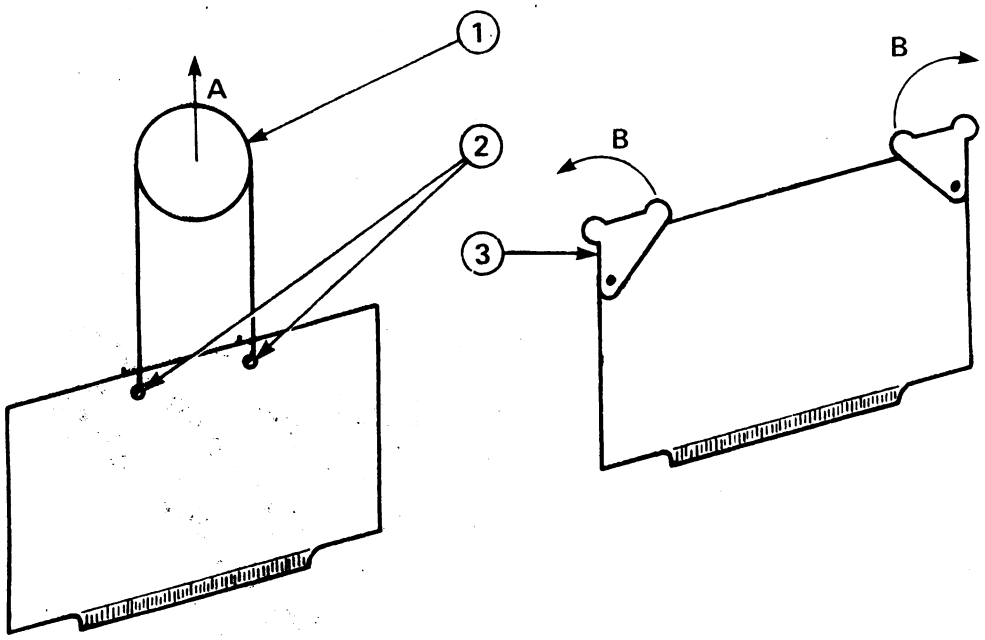
Removal

- lift up the OPERATOR'S COVER (2) ,
- disconnect the PAPER DEFLECTOR grounding cord,
- push the PAPER FEED (3) towards the front of the machine,
- push the two bolts (1) in the direction of arrow A,
- remove the MAINTENANCE COVER in the direction of arrow B.

Réinstallation

- proceed in removal reverse order,
- do not forget to reconnect the PAPER DEFLECTOR ground cord.

4.3 ELECTRONIC BOARDS



Removal

- remove the MAINTENANCE COVER,
- disconnect the upper connectors if necessary,

  IMPORTANT : DO NOT PULL ON THE WIRES.

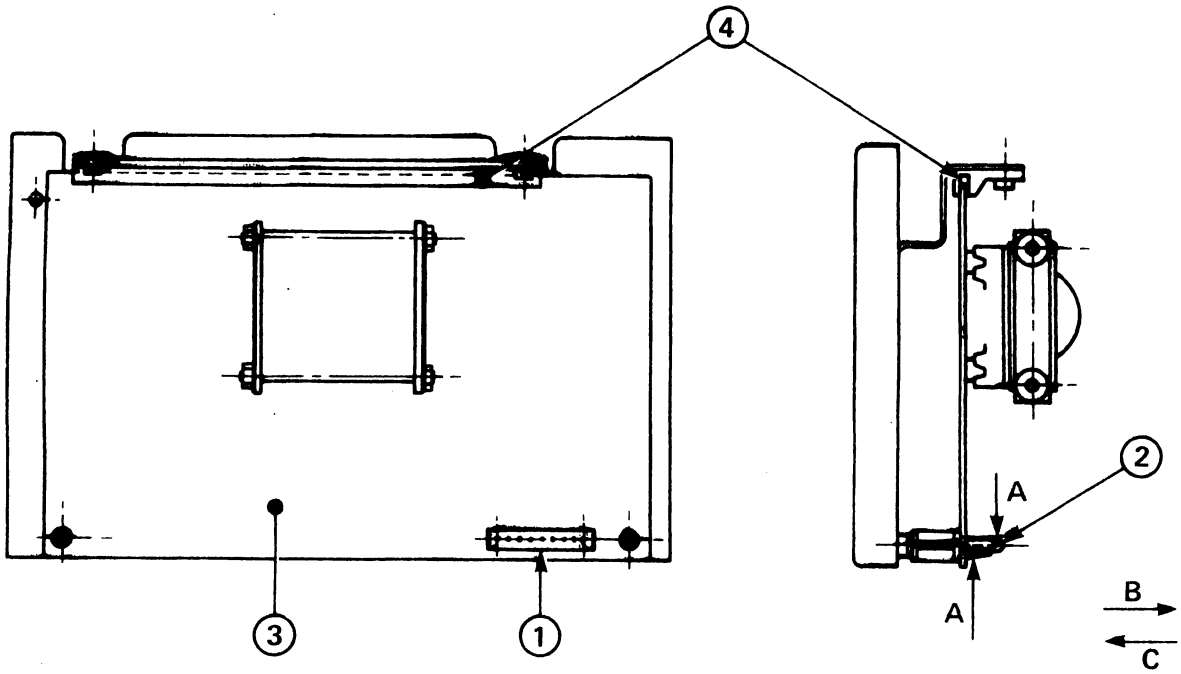
- either use the extractor for board (1) located under the COVER, in holes (2) ; and then pull in direction of arrow A,
- or pivot the extractors (3) in the direction of arrow B.

Reinstallation

- check that the position of the different jumpers and selector switches corresponds to the machine operating mode,
- reconnect the upper connectors if necessary.

NOTE : DO NOT FORGET to remove the memory circuits fitted on the support and to position them in the same place on the new board. This is particularly important for the MPU, PRINTER MPU, ANSWERBACK CODE + ADAPTATION CONTROL(PERSONALISATION) and DISPLAY INTERFACE boards.

4.4 TELEGRAPH POWER SUPPLY



Removal

- remove the MAINTENANCE COVER,
- remove the PRINTER INTERFACE board,
- remove the PRINTER MPU board,
- disconnect connector (1) ,
- pinch together attachment points (2) in direction of arrows A,
- gently lift out the board (3) as per arrow B,
- remove the TELEGRAPH POWER SUPPLY board.

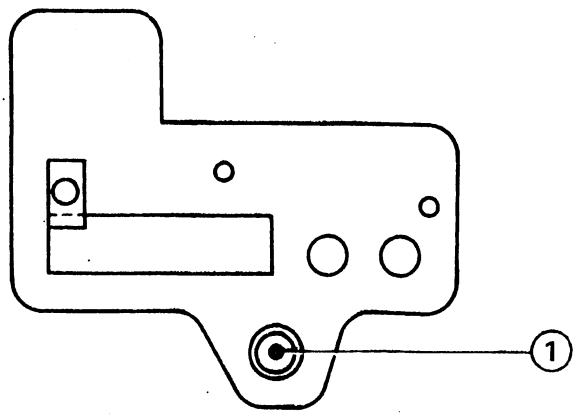
Reinstallation

- insert the board (3) into the board guide (4) ,
- push on board (3) as per arrow C,
- connect the connector (1) ,
- fit the PRINTER INTERFACE, PRINTER MPU boards,

DO NOT FORGET TO RECONNECT THE PRINTER CONNECTORS.

- fit the MAINTENANCE COVER.

4.5 OPERATING CONNECTION



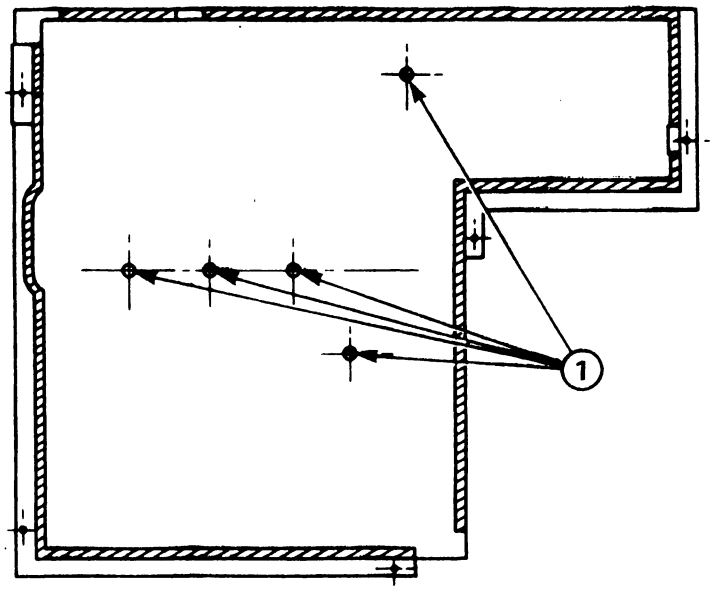
Removal

- unscrew the knurled wheel (1) ,
- remove the OPERATING CONNECTION by pulling toward the outside of the machine,
- disconnect the line cord, if necessary.

Reinstallation

- proceed in removal reverse order.

4.6 MASTER BOARD



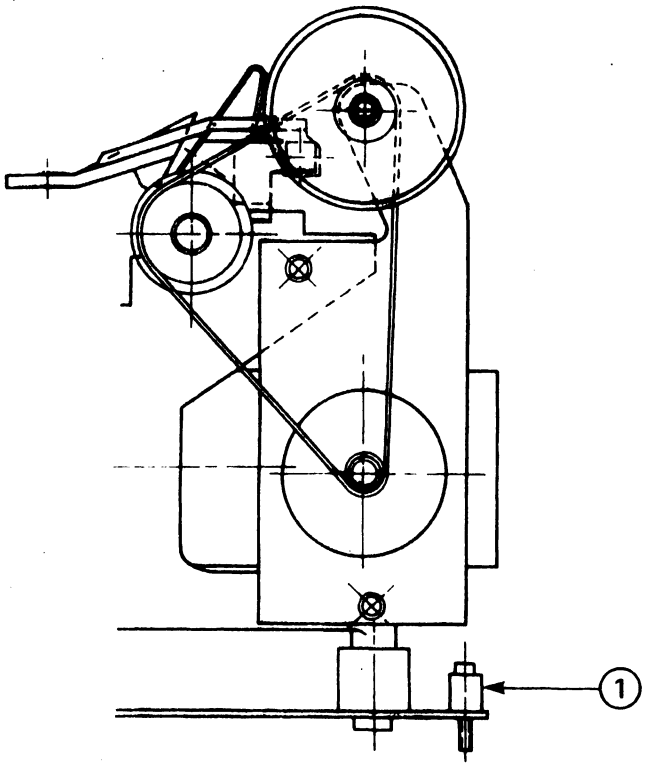
Removal

- remove the electronic boards,
- disconnect the connectors located on the MASTER board,
- stand the machine vertically on its rear side,
- remove the five screws (1) from the MASTER board support located underneath the machine,
- remove the MASTER board support,
- remove the MASTER board.

Reinstallation

- proceed in removal reverse order.

4.7 PRINTER



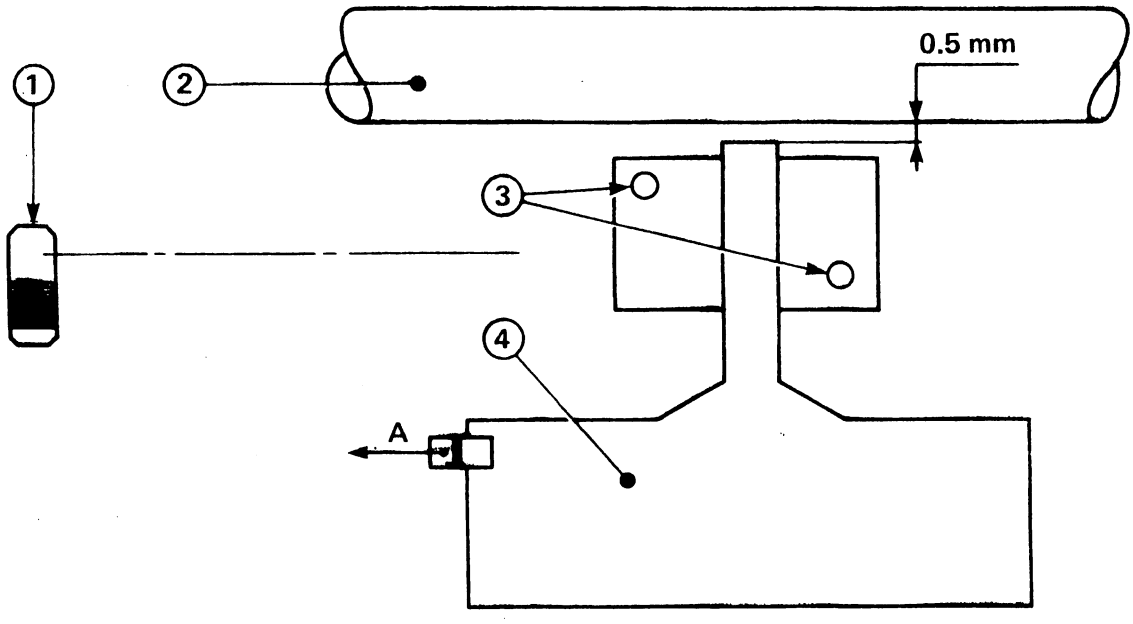
Removal

- remove the MAINTENANCE COVER,
- disconnect the PRINTER INTERFACE board upper connectors,
- disconnect the TELEGRAPH POWER SUPPLY connector,
- loosen screws (1) ,
- lightly push back the CHASSIS,
- disengage the CARRIAGE CABLE from its clip located on the DISPLAY SCREEN,
- remove the PRINTER.

Reinstallation

- proceed in removal reverse order.

4.8 PRINTER DEVICE



Removal

- remove the MAINTENANCE COVER,
- remove the RIBBON CARTRIDGE,
- disconnect the PRINTER DEVICE (4) along arrow A,
- remove the PRINTER DEVICE protective cover by opening out one of its mounting lugs.

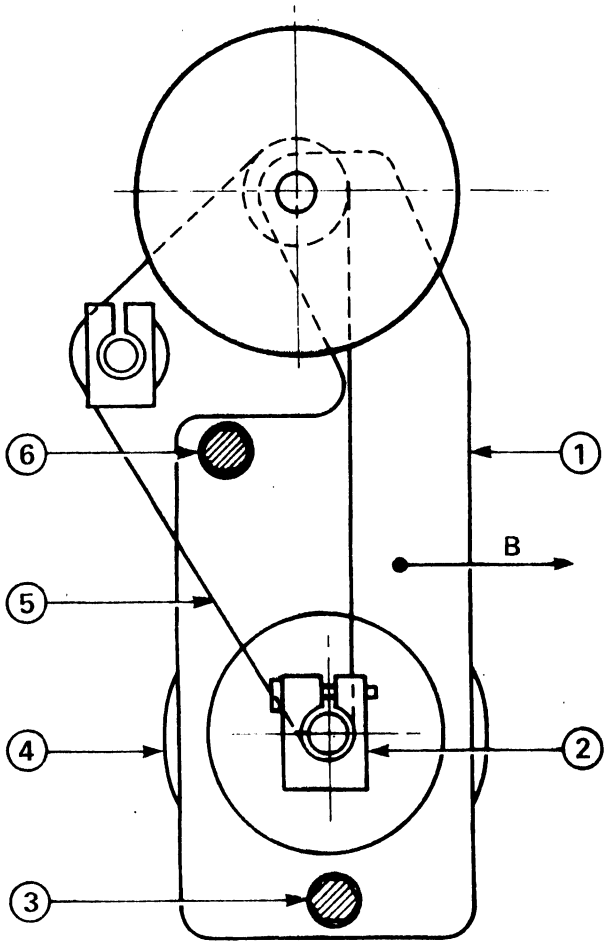
IMPORTANT : NEVER UNSCREW THE PAINTED SCREWS.

- remove the 2 mounting screws (3) ,
- remove the PRINTER DEVICE and the RIBBON GUIDE PIN.

Reinstallation

- proceed in reverse removal order but before tightening home the 2 PRINTER DEVICE mounting screws (3) , perform the following adjustment:
  . position the adjuster lever (1) in the smallest gap position.
- use a thickness gauge to set the distance between the end of the PRINTER DEVICE and the PRINT ROLLER (2) (adjustment performed without paper and without ribbon) to 0.5 mm.

4.9 LINEFEED MOTOR



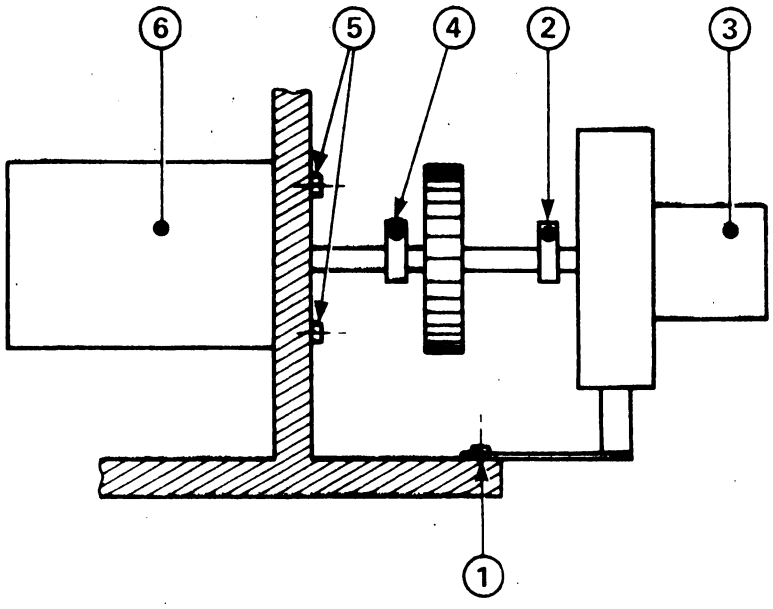
Removal

- remove the PRINTER,
- remove the two screws (3) and (6) for the LINEFEED MOTOR (1) support mounting,
- disengage the notched belt (5) ,
- remove the LINEFEED MOTOR-support assembly.

Reinstallation

- proceed in removal reverse order and in order to set the drive belt tension :
  - . fit screws (3) and (6) but do not tighten home,
  - . check that belt (5) is properly engaged,
  - . the correct tension for belt (5) is supplied by the LINEFEED MOTOR (4) weight,
  - . tighten screws (3) and (6) .

4.10 SENSOR/CODER



Removal

- disconnect the SENSOR/CODER from the PRINTER INTERFACE,
- remove the SENSOR/CODER attachment screw (1) ,
- disconnect the distortion hub screw (2) ,

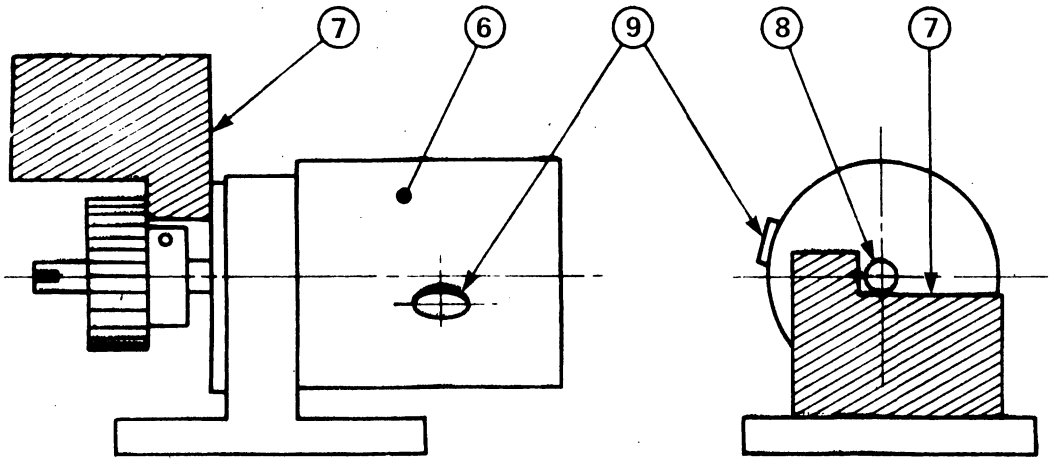
IMPORTANT : NEVER UNSCREW THE PAINTED SCREWS

- remove the SENSOR/CODER (3) .

Reinstallation

- proceed in removal reverse order.

4.11 DRIVE MOTOR



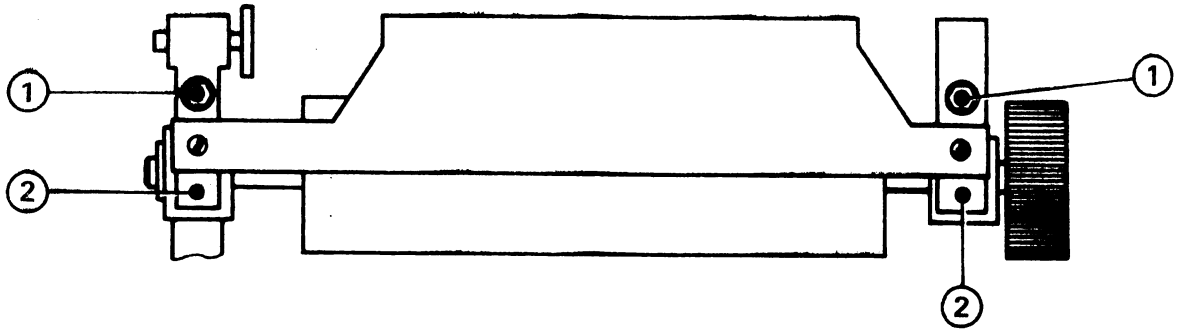
Removal

- remove the PRINTER,
- remove the SENSOR/CODER (3) ,
- remove the notched belt,
- remove the distortion hub (4) and the drive pulley,
- remove the 3 DRIVE MOTOR attachment screws (5) ,
- remove the DRIVE MOTOR (6) .

Reinstallation

- proceed in removal reverse order,
- position the flange and the DRIVE MOTOR assembly without blocking the three screws (5) . The position of the brushes MUST be respected (9) ,
- adjust the position of the motor shaft (8) for height using the setting tool (7) ,
- tighten the three DRIVE MOTOR (6) attachment screws (5) ,
- install the pulley and adjust its position with the setting tool (7) ,
- fit the SENSOR/CODER (3) ,
- tighten the two distorsion hub screws (2) and (4) .

4.12 PRINT ROLLER



Removal

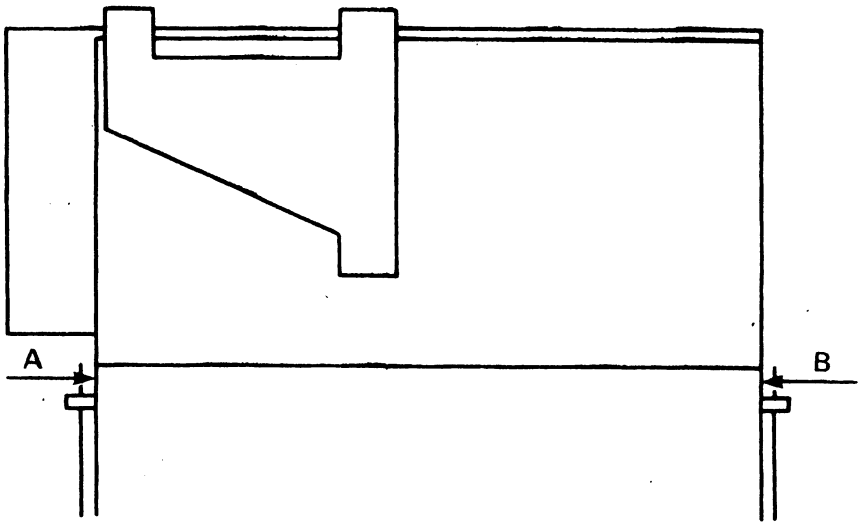
- lift up the OPERATOR'S COVER,
- remove the two screws (1) attaching the PRINT ROLLER flanges (2) ,
- disengage the belt,
- remove the flanges and the PRINT ROLLER.

The PRINT ROLLER is fitted with the pulley and its bearings.

Reinstallation

- proceed in removal reverse order.

4.13 PAGE PAPER FEED



Removal

- lift up the MAINTENANCE COVER,
- remove the PAPER ROLLER,
- remove the end of paper connector,
- disengage the module by pushing first along arrow A and then along arrow B,
- remove the PAGE PAPER FEED.

Reinstallation

- proceed in removal reverse order.

4.14 KEYBOARD

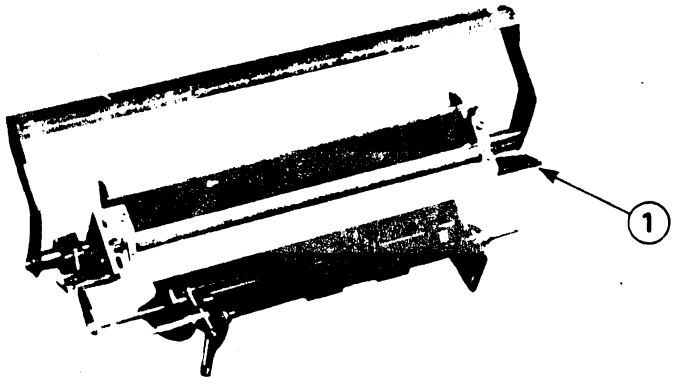
Removal

- remove the MAINTENANCE COVER,
- remove the front and the guard from around the KEYBOARD,
- disconnect the connectors,
- remove the KEYBOARD.

Reinstallation

- proceed in removal reverse order.

4.15 PRESSURE ROLLERS



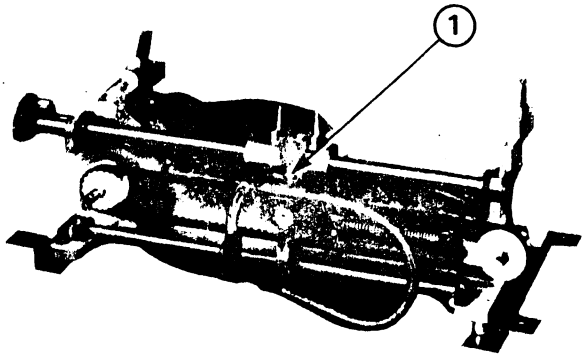
Removal

- remove the MAINTENANCE COVER,
- remove the PAGE PAPER FEED,
- disengage the PRINT ROLLER ROLLERS with the lever,
- remove the two screws (1) ,
- remove the PRESSURE ROLLERS.

Reinstallation

- bring the module into abutment against the CHASSIS and proceed in reverse removal order.

4.16 CARRIAGE CABLE



Removal

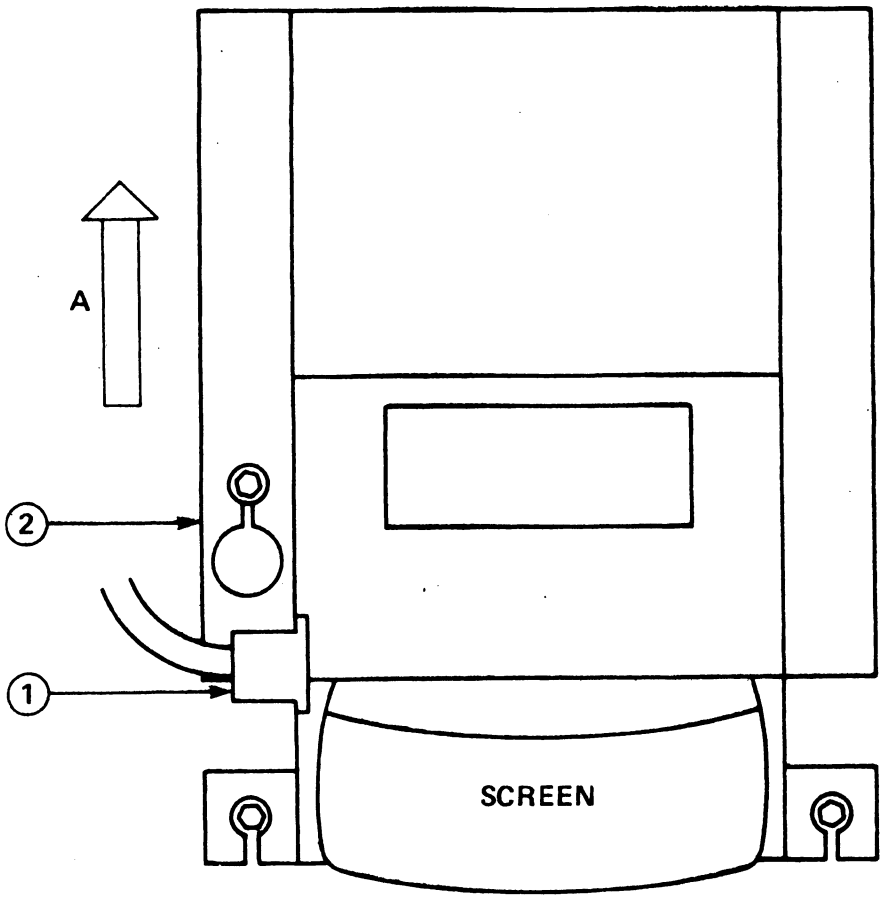
- remove the PRINTER,
- remove the PRINTER DEVICE,
- remove nut (1) which fixes the cable attachment flange,
- remove the CARRIAGE CABLE.

Reinstallation

- proceed in removal reverse order.

IMPORTANT : DO NOT DISTORT THE SPRING SHEATH, THE TOP SHOULD REMAIN FREE INSIDE THE SHEATH.

4.17 DISPLAY SCREEN



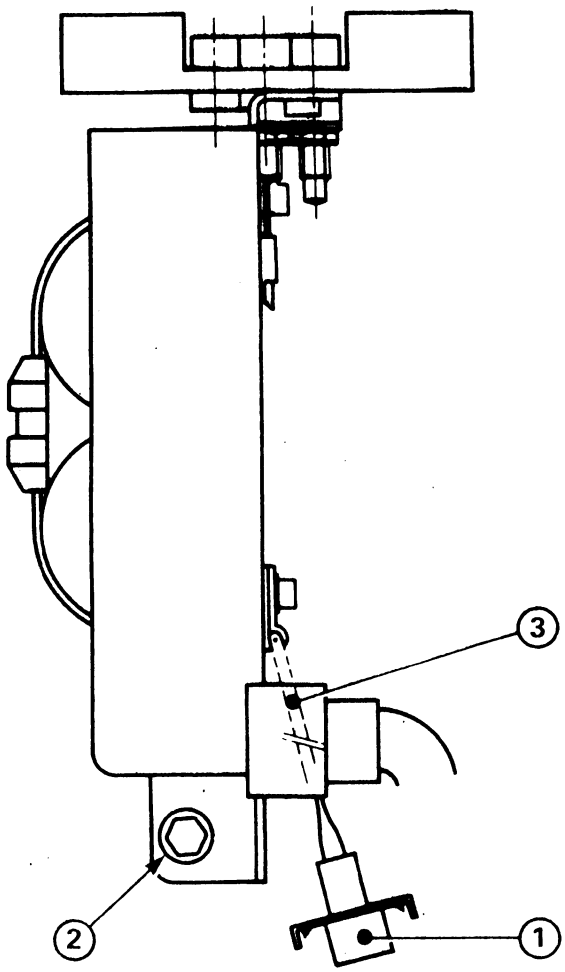
Removal

- remove the TOP COVER,
- disconnect the connector (1) ,
- loosen screw (2) ,
- disengage the assembly along arrow A,
- remove the DISPLAY SCREEN.

Reinstallation

- proceed in removal reverse order.

4.18 POWER AMPLIFIER



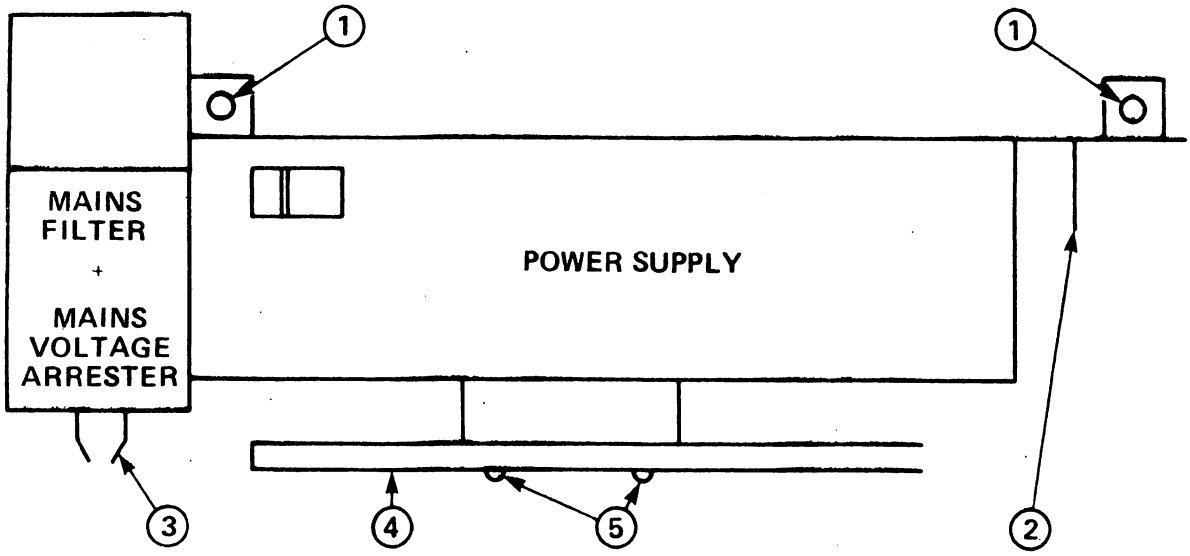
Removal

- remove the MAINTENANCE COVER,
- disconnect connectors (1) and (3) ,
- remove screw (2) ,
- remove the POWER AMPLIFIER.

Reinstallation

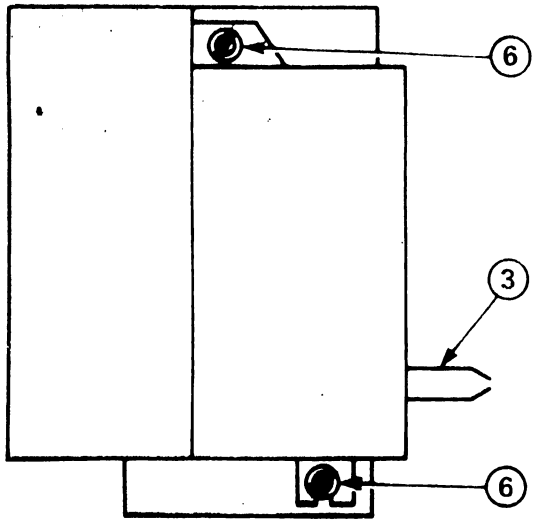
- proceed in removal reverse order.

4.19 POWER SUPPLY AND MAINS FILTER



Removal

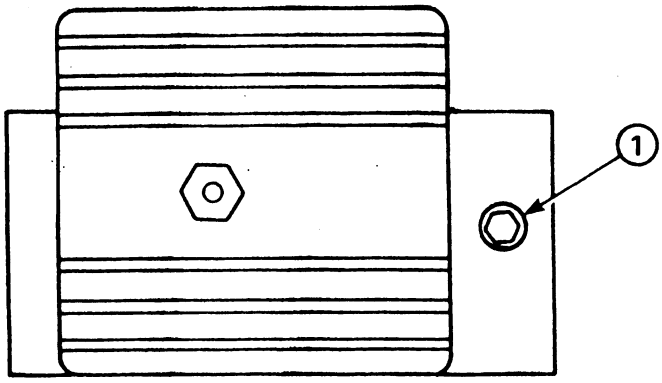
- remove the MAINTENANCE COVER,
- disconnect connectors (2) ,
- disconnect the MAINS CORD (3) ,
- remove the HEATSINK (4) attached by the 4 screws (5) ,
- remove screws (1) ,
- remove the POWER SUPPLY and MAINS FILTER unit,
- remove screws (6) ,
- remove the MAINS FILTER.



Reinstallation

- proceed in removal reverse order.

4.20 BATTERY



Removal

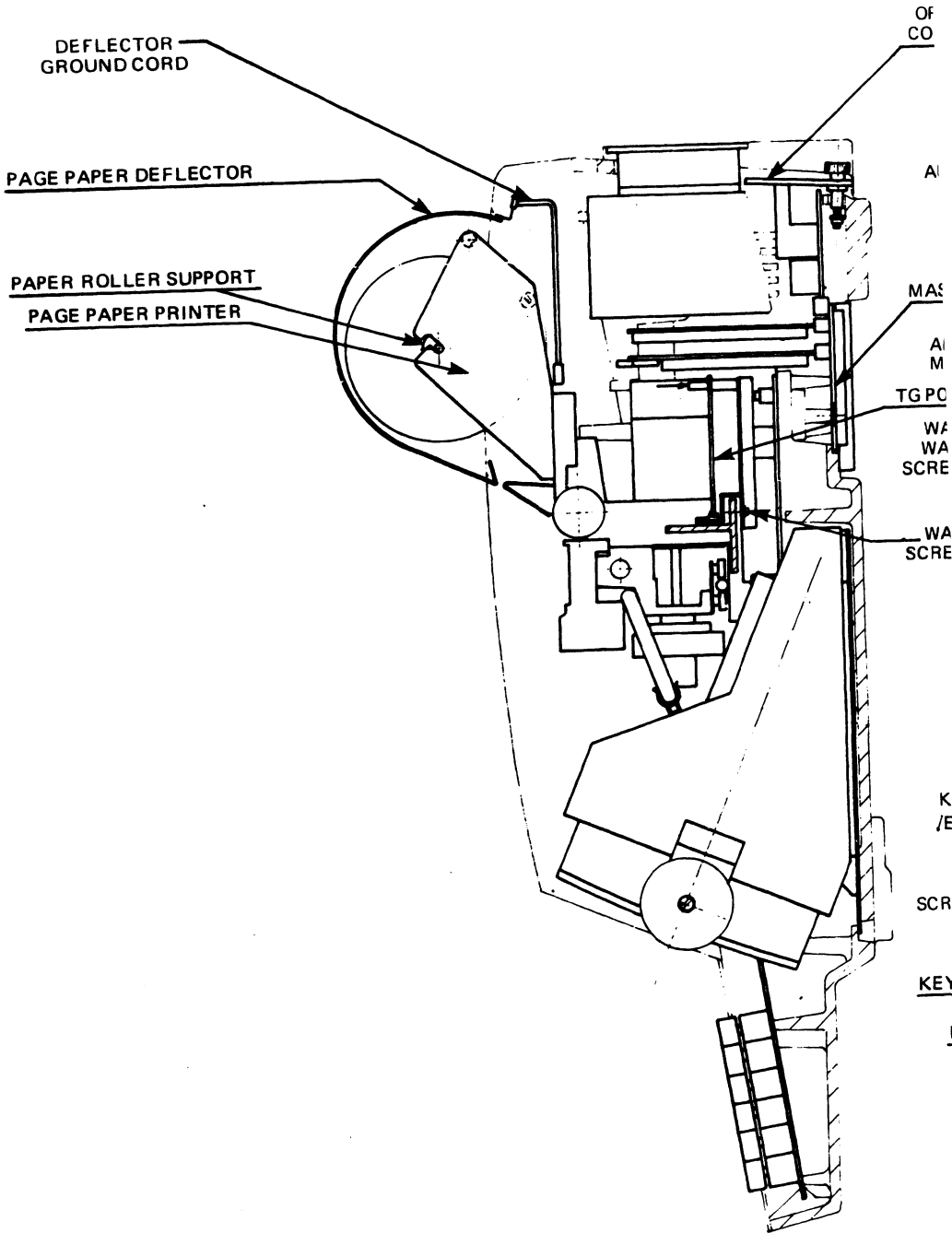
- remove the TOP COVER,
- remove screw (1) ,
- disconnect connector,
- disengage the module to the right,
- remove the BATTERY.

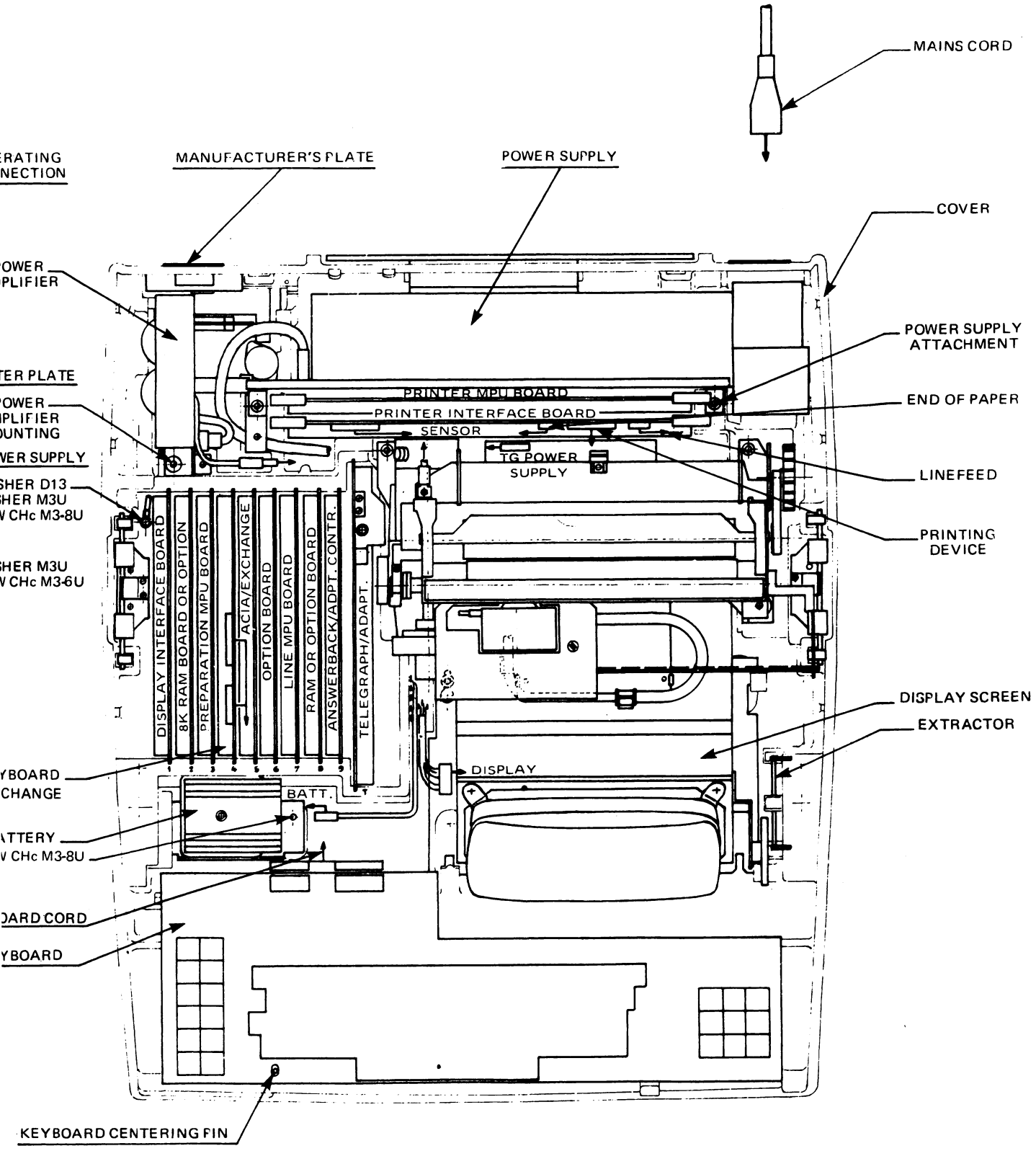
Reinstallation

- proceed in removal reverse order.

PLATE 1

LAYOUT
N° 23 110 760 - 8




MAINS CORD
ERATING
NECTION
MANUFACTURER'S PLATE
POWER SUPPLY
COVER
OWER
PLIFIER
POWER SUPPLY
ATTACHMENT
TER PLATE
OWER
PLIFIER
OUNTING
WER SUPPLY
PRINTER MPU BOARD
PRINTER INTERFACE BOARD
END OF PAPER
SENSOR
TG POWER
SUPPLY
LINEFEED
SHER D13
SHER M3U
V CHc M3-8U
PRINTING
DEVICE
SHER M3U
V CHc M3-6U
DISPLAY INTERFACE BOARD
8K RAM BOARD OR OPTION
PREPARATION MPU BOARD
ACIA/EXCHANGE
OPTION BOARD
LINE MPU BOARD
RAM OR OPTION BOARD
ANSWERBACK/ADPT. CONTR.
TELEGRAPH/ADAPT.
DISPLAY SCREEN
EXTRACTOR
YBOARD
CHANGE
DISPLAY
BATT.
ATTERY
V CHc M3-8U
OARD CORD
YBOARD
KEYBOARD CENTERING PIN

3

NOMENCLATURE ILLUSTREE

ILLUSTRATED CATALOGUE

NOMENCLATURA ILUSTRADA

ILLUSTRIERTES TEILEVERZEICHNIS

AVANT-PROPOS

1 - COMPOSITION DU DOCUMENT

Le présent document comprend :

- une planche 00 (zéro) accompagnée de son texte ; cette planche présente les différents ensembles susceptibles d'être déposés sur le site,
- un répertoire des fabricants.

2 - REPERAGE DE LA PLANCHE 00

Sur la planche 00, chaque composant principal est identifié par un «repère».

Lorsqu'un composant principal possède plusieurs variantes, il est identifié sur la planche 00 par un même repère numérique, suivi d'un indice alphabétique propre à chaque variante.

Dans le texte, certains articles ont leur numéro de repère précédé d'un tiret ; dans ce cas, l'article n'est pas localisé sur la planche.

3 - UTILISATION DU PRESENT DOCUMENT

Connaissant un article par sa position sur le matériel, rechercher le repère du composant principal correspondant en consultant la planche 00.

Se reporter au «REPERTOIRE DES FABRICANTS» qui donne en fonction du code fabricant (colonne 1), le nom et l'adresse du fabricant (colonne 2).

NOTA : Les composants électriques et électroniques possédant un repère circuit, sont identifiés par celui-ci sur la planche et dans le texte (2ème ligne de la colonne 3).

4 - REPRESENTATION DES LIENS D'APPARTENANCE ENTRE ARTICLE ET ENSEMBLE

La notion d'appartenance d'un article à un ensemble apparaît dans le texte selon le principe suivant :

- un article fait partie de l'ensemble immédiatement «supérieur» dont la description est décalée d'un rang vers la gauche,
- un ensemble comprend tous les articles ou ensembles immédiatement «inférieurs» dont la description est décalée d'un rang vers la droite.

Les articles de fixation ne sont pas illustrés et n'ont pas de repère particulier. Ils apparaissent dans le texte immédiatement en dessous de l'article qu'ils fixent, et sur le même rang que celui-ci.

5 - SIGNES ET ABREVIATIONS

- SB («SUIVANT BESOIN»)

Utilisé lorsque l'article ne peut être défini qu'au moment du réglage de l'appareil.

- ******

Ce signe utilisé en colonne 2 de la nomenclature illustrée indique que l'article n'est pas prévu en rechange.

6 - COMMANDE DE PIECES DE RECHANGE

Pour commander une pièce de rechange, il est nécessaire d'indiquer :

- le nom de l'appareil, sa référence et son numéro de série (sur la plaque constructeur),
- la désignation de la pièce selon la nomenclature,
  Ex. : RESSORT
- le numéro de code suivi de sa clé,
  Ex. : 23008560-6

Les commandes de pièces de rechange et la corrrespondance s'y rapportant (demandes de prix, délais de livraison, facturation, etc.) sont à formuler à :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

Dans les cas d'urgence, les demandes de rechange peuvent être formulées par téléphone ou de préférence par message télex à l'adresse ci-dessus.

FOREWORD

1 - DOCUMENT COMPOSITION

The present document includes :

- a plate 00 (zéro) with its text ; this Plate shows the various assemblies likely to be removed in situ,
- an Index of Manufacturers.

2 - PLATE 00 IDENTIFICATION

On Plate 00, each main component is identified by an «item number».

When a main component has several variants, it is identified on Plate 00 with a same item number followed by an alphabetical index proper to each variant.

In the text, some items have their item number preceded by a dash ; in that case, the item is not located on the Plate.

3 - HOW TO USE THE PRESENT DOCUMENT

Knowing an item by its position on equipment, seek out the item No of the main corresponding component, by consulting the Plate 00.

Refer to the «INDEX OF MANUFACTURERS» which gives, according to the Manufacturer's code (column 1), the name and address of Manufacturer (column 2).

NOTE : Electric and electronic components having a circuit reference code, are identified by this code in Plate and text (2nd line of column 3).

4 - REPRESENTATION OF RELATIONSHIP BETWEEN ITEM AND ASSEMBLY

The notion of an item belonging to an assembly appears in the text according to the following principle :

- an item belongs to the assembly immediately «uper», whose description is shifted by one row to the left,
- an assembly includes all of the items or assemblies immediately «lower», whose description is shifted by one row to the right.

The attaching items are not illustrated and have no special item number. They appear in the text immediately belows the item they attach, and in the same row as this item.

5 - SIGNS AND ABBREVIATIONS

- SB («SUIVANT BESOIN»)

This indicates that the quantity required can only be determined when carrying out maintenance or adjustements.

- ******

This sign in column 2 of parts list means taht no spare is provided for this component.

- (R1) A (R4)

Mention in french whose translation is : (R1) TO (R4).

6 - ORDER FOR REPLACEMENT PARTS

When ordering a part, please indicate :

- machine name, its reference and serial number (on name plate),
- the part name,
  e.g. : «SPRING»

Orders and all related correspondance (enquiries, concerning bills, delivery dates, etc.) should be addressed to :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

Urgent orders may be telephoned or (preferably) telexed to the same address.

PROLOGO

1 - COMPOSICION DEL DOCUMENTO

El presente documento comprende :

- una lámina 00 (cero) acompañada de su texto ; esta lámina presenta los diferentes conjuntos que pueden sur desmontados «in situ»,
- un repertorio de los fabricantes.

2 - REFERENCIACIÓN DE LA LÁMINA 00

En la lámina 00 cada componente principal es identificado por una «referencia».

Cuando un componente principal posede diversas variantes, se identifica en la lámina 00 con la misma referencia numérica, seguida por un índice alfabetico propio de cada variante.

En tel texto, una barra precede el número de referencia de ciertos artículos ; en este caso, el artículo no se encuentra localizado en la lámina.

3 - USO DEL PRESENTE DOCUMENTO

Conociendo un artículo por su posición en el material, buscar la referencia del componente principal correspondiente consul tando la lámina 00.

Referirse al «REPERTORIO DE LOS FABRICANTES» que suministra, en función del código fabricante (columna 1), el nombre y la dirección del fabricante (columna 2).

NOTA : Los componentes eléctricos y electrónicos poseen una referencia circuito, gracias a la cual son identificados en la lámina y en el texto (2ª linea de la columna 3).

4 - REPRESENTACION DE LOS VINCULOS ENTRE ARTICULO Y CONJUNTO

La noción de vínculo entre un artículo y un conjunto aparece en el texto, de acuerdo con el principio siguiente :

- un artículo forma parte del conjunto inmediatamente «superior», cuya posición se encuentra corrida de una fila hacia la izquierda,
- un conjunto comprende todos los artículos o conjuntos inmediatamente «inferiores», cuya descripción se encuentra corrida de una fila hacia la derecha.

Los artículos de sujeción no son referenciadas y no llevan una referencia particular. Aparecen en el texto inmediatamente por debajo del artículo que sujetan y en la misma fila que éste.

5 - SIGNOS Y ABREVIACIONES

- SB («SEGUN NECESIDAD»)

Empleado cuando el artículo sólo puede ser definido en el momento del reglaje del aparato.

- ******

Este signo empleado en la columna 2 de la nomenclatura ilustrada, indica que el artículo no ha sido previsto en los recambios.

- R1 A R4

Mención en francés, cuya traducción es R1 A R4.

6 - PEDIDO DE PIEZAS DE RECAMBIO

Para pasar pedido por una pieza de recambio, es preciso indicar :

- el nombre del aparato, su referencia y su número de serie (que se leen en la placa del constructor),
- la designación de la pieza de acuerdo con la nomenclatura,
  Ejemplo : MUELLE
- el número de código, seguido de su clave,
  Ejemplo : 23008560-6

Los pedidos de piezas de recambio y la correspondencia referente a ellos (solicitudes de precios, plazos de entrega, facturación, etc.), deben sar dirigidos a :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

En los casos urgentes, las solicitudes de piezas de recombio pueden hacerse por teléfono ó preferentemente por mensaje telex a la dirección siguiente.

VORWORT

1 - ZUSAMMENSETZUNG DES DOKUMENTES

Das vorliegende Dokument umfasst :

- eine Zeichnung 00 (null) mit Text, die die Verschiedenen Baugruppen, die an der Baustelle ausgebaut werden können, darstellt,
- ein Verzeichnis der Hersteller.

2 - KENNZEICHNUNG DER ZEICHNUNG 00

Bei der Zeichnung 00 wird jedes Hauptbauelement durch ein «kennzeichen» identifiziert.

Wenn ein Hauptbauelement mehrere Varianten besitzt wird es auf der Zeichnung 00 durch ein gleiches numerisches Kennzeichen, dem ein jeder Variante eigenes alphabetisches Merkmal folgt, identifiziert.

Im text geht verschiedenen Artikeln ein Strich voran ; in diesem Falle ist der Artikel nicht in der Zeichnung angegeben.

3 - BENUTZUNG DES VORLIEGENDEN DOKUMENTES

Wenn ein Artikel durch seine Position auf dem Gerät bekannt ist, die Zeichnung 00 einsehen, um das Kennzeichen des entsprechenden Hauptbauelementes zu ermittein.

Siehe das «VERZEICHNIS DER HERSTELLER» welches in Bezug auf den Code des Herstellers (Spalt 1) den Namen und die Anschrift des Herstellers angibt (Spalt 2).

HINWEIS : Die elektrischen und elektronischen Bauelemente, die ein Schaltungskennzeichen besitzen, werden in der Zeichnung und im Text (2. Zeile des Spaltes 3) dadurch identifiziert.

4 - DARSTELLUNG DER ZUSAMMENHANGE ZWISCHEN ARTIKEL UND BAUGRUPPE

Der Begriff «Zusammenhang» zwischen Artikel und Baugruppe erscheint im Text noch dem nachstchenden Prinzip :

- ein Artikel gehört zum sofort «darüberliegenden» Baugruppe, dessen Beschreibung um eine Reihe nach links verschoben ist,
- ein baugruppe umfasst alle sofort «darunterliegenden» Artikeln oder Baugruppen, deren Beschreibung um eine Reihe nach rechts verschoben ist.

Die Befestigungsartikel sind nicht dargestellt und besitzen kein besonderes Kennzeichen. Im Text erscheinen sie direkt unter dem Artikel, den sie befestigen und in dergleichen Reihe wie dieser.

5 - ZEICHEN UND ABKURZUNGEN

- SB («NACH BEDARF»)

Dieses Zeichen wird dann benützt, wenn der Artikel erst zum Zeitpunkt der Einstellung des Gerätes definiert werden kann.

- ******

Dieses im Spalt 2 der Stückliste mit Bildern benützte Zeichen bedented, dass der Artikel nicht als Ersatzteil vorgesehen ist.

- R1 A R4

Französischer Begriff der mit R1 bis R4 zu übersetzen ist.

6 - BESTELLUNG VON ERSATZTEILEN

Zur Restellung eines Ersatzteiles muss folgendes angegeben werden :

- der Name des Gerätes, die Referenz und die Seriennummer (auf dem Leistungsschild des Herstellers),
- die Bezeichnung des Teiles entsprechend der Stückliste,
  Beispiel : FEDER
- die Codenummer mit dem Schlüssel,
  Beispiel : 23008560-6

Die Bestellungen von Ersatzteilen und die damit verbundene Korrespondenz (Auskünfte über Preise und Liefertermine, Rechnungen, usw) sind zu richten an :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone 745-14-60 - Télex : 611890F - SAGEM PARIS

In dringenden Fällen können die Bestellungen von Ersatzteilen per Telefon oder verzugsweise per FS an nachstehende Adresse vorgenommen werden.

PLANCHE 00

PLATE 00

LAMINA 00

ZEICHNUNG 00

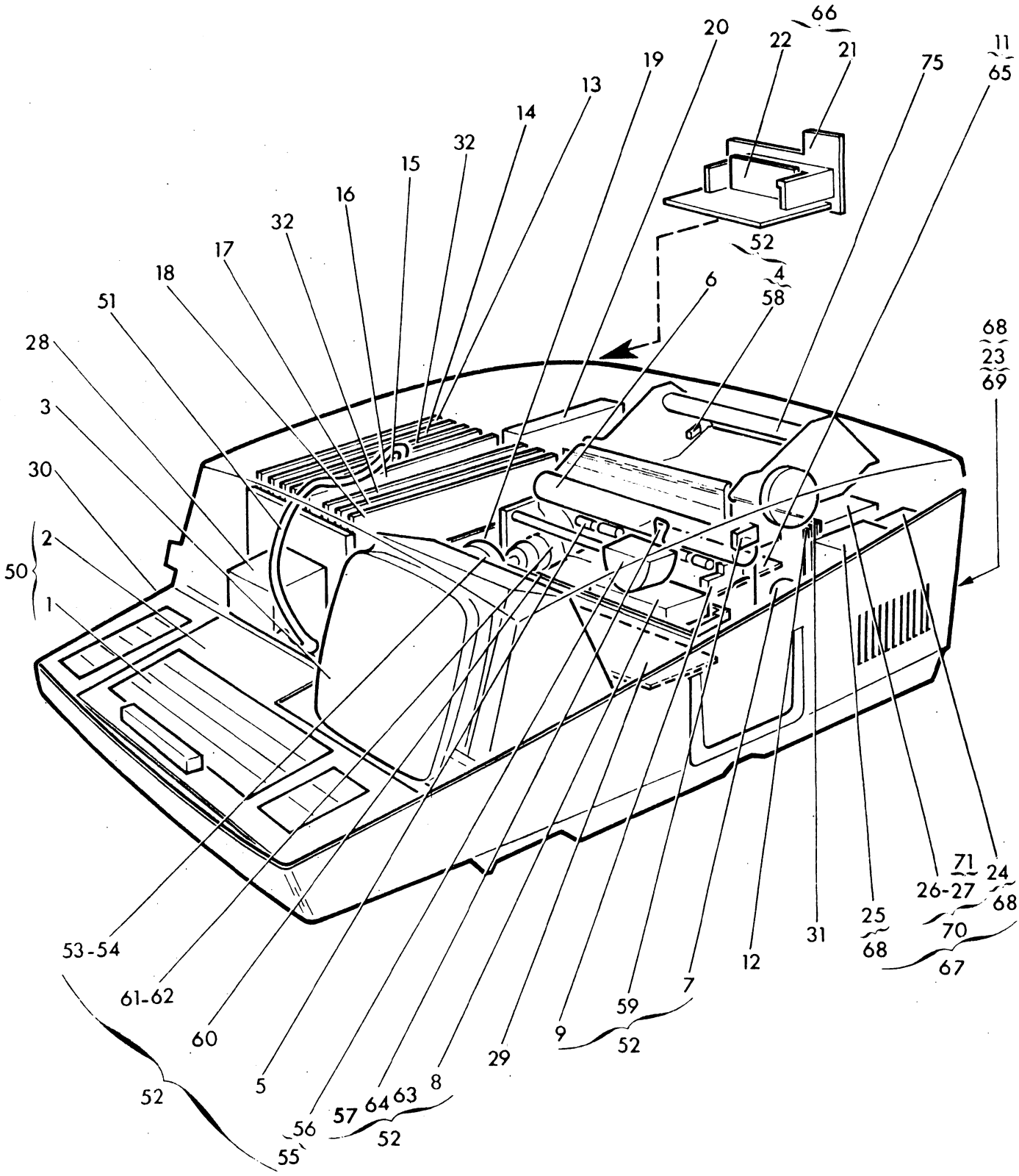


PLANCHE	00	TELEIMPRIMEUR	TX35
PLATE		*TELEPRINTER*	*TX35*
TABLA		TELEIMPRESOR	TX35
ABBILDUNG		*FERNSCHREIBER*	*TX35*

1	2	3 (1 2 3 4 5 6 7)	4		5
00	*********	TELEIMPRIMEUR TX35	*********	53840	
50A	23102326-6	. CLAVIER	23102326-6	53840	01
1	*********	. . TOUCHES	*********	53840	01
2A	*********	. . CARTE CLAVIER	*********	53840	01
50B	23104981-9	. CLAVIER	23104981-9	53840	01
1	*********	. . TOUCHES	*********	53840	01
2B	*********	. . CARTE CLAVIER	*********	53840	01
51	23104454-6	. CORDON CLAVIER	23104454-6	53840	01
3	23104449-2	. ECRAN DE VISUALISATION	23104449-2	53840	01
52	23104451-2	. IMPRIMANTE	23104451-2	53840	01
53	23075926-3	. . CAPTEUR CODEUR	23075926-3	53840	01
	23074596-2	. . VIS DE FIXATION	23074596-2	53840	01
	23058757-6	. . MOYEU A DEFORMATION	23058757-6	53840	01
	15600058-4	. . VIS CHC M3X6 AC A33	E27161-30M16QVUL	50035	01
54	23083266-1	. . PROLONGATEUR CAPTEUR-CODEUR	23083266-1	53840	01
55	23082849-8	. . DISPOSITIF D'IMPRESSION	23082849-8	53840	01
56	23083146-6	. . . CARTER	23083146-6	53840	01
57	23103973-0	. . EPINGLE GUIDE RUBAN	23103973-0	53840	01
	23059763-4	. . BRIDE DE FIXATION	23059763-4	53840	01
	15600050-0	. . VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	02
	15700295-4	. . RONDELLE Z3U AC.A33	E27611E30AAUL	50035	02
4	23102401-5	. . DEROULEMENT DE PAPIER	23102401-5	53840	01
58	23101867-4	. . . INTERRUPTEUR DE COMMANDE "FIN DE PAPIER"	23101867-4	53840	01
	23073797-3	. . . PLAQUETTE TARAUDEE	23073797-3	53840	01
	15620977-3	. . . VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	02
	15700261-5	. . . RONDELLE Z3U AC.A33	E27611E30AAUL	50035	02
5	23102399-3	. . GALETS PRESSEURS	23102399-3	53840	01
	15600052-1	. . VIS CHC M3X10 AC.CL.8-8	E27161-30Q10QVUL	50035	02
	15700257-4	. . RONDELLE M3U AC.A33	E27611M30AAUL	50035	02
59	23075091-3	. . SUPPORT DE REGLETTE	23075091-3	53840	02
6	23102400-2	. . ROULEAU DE FRAPPE	23102400-2	53840	01
	23058916-1	. . BRIDE	23058916-1	53840	02
	15600274-9	. . VIS CHC M3X20 AC.CL.8 8	E27161-30M20QVUL	50035	02
	23058915-8	. . COUSSINET	23058915-8	53840	01
7	23102375-8	. . MOTEUR D'INTERLIGNE	23102375-8	53840	01
	15600050-0	. . VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	02
	15700257-4	. . RONDELLE M3U AC.A33	E27611M30AAUL	50035	02
	23083265-8	. . . PROLONGATEUR INTERLIGNE	23083265-8	53840	01
60	23104251-8	. . COURROIE CREMAILLERE	23104251-8	53840	01
8	23104596-0	. . ENTRAINEMENT CARTOUCHE PAR COURROIE	23104596-0	53840	01
	23083267-9	. . ENTRETOISE	23083267-9	53840	02
	15620895-8	. . VIS CL M3X12 AC.CL.5-6	E27116C30Q12QEUL	50035	02
	15700257-4	. . RONDELLE M3U AC.A33	E27611M30AAUL	50035	02
9	*********	. . BATI IMPRIMANTE	*********		01
61	23077774-5	. . . MOTEUR D'AVANCE	23077774-5	53840	01
	15600050-0	. . . VIS CHC M3X3 AC.CL.8-8	E27161-30Q8QVUL	50035	03
	15700257-4	. . . RONDELLE M3U AC.A33	E27611M30AAUL	50035	03
62	23058841-1	. . . MOYEU A DEFORMATION	23058841-1	53840	01
	15600058-4	. . . VIS CHC M3X16 AC.CL.8-8	E27161-30Q16QVUL	50035	01
63	23110018-8	. . . CABLE CHARIOT	23110018-8	53840	01
64	23058831-2	. . . BRIDE	23058831-2	53840	01
	15700257-4	. . . RONDELLE M3U AC.A33	E27611M30AAUL	50035	01
	15500019-7	. . . ECROU H M3 AC.CL.5	E27411A30QQFUL	50035	01
10	*********	. . EQUIPEMENTS COMPLEMENTAIRES A L'IMPRIMANTE	*********	53840	01
11	*********	. ALIMENTATION TELEGRAPHIQUE	*********	53840	01
	15600050-0	. VIS CHC M3X6 AC.CL.8-8	E27161-30Q8QVUL	50035	02
	15700257-4	. RONDELLE M3U AC.A33	E27611M30AAUL	50035	02
65	23103403-2	. CARTE ALIMENTATION TELEGRAPHIQUE	23103403-2	53840	01
12	23104973-6	. CARTE INTERFACE IMPRIMANTE	23104973-6	53840	01
13	23101706-5	. CARTE INTERFACE VISUALISATION	23101706-5	53840	01
14A	23103143-2	. CARTE MEMOIRE 8K(2114)	23103143-2	53840	01
14B	23103147-4	. CARTE MEMOIRE 8K(6514)	23103147-4	53840	01
15	23104086-1	. CARTE INTERFACE CLAVIER + ECHANGES	23104086-1	53840	01
16	23101713-0	. CARTE INTERFACE ACIA + ECHANGES	23101713-0	53840	01

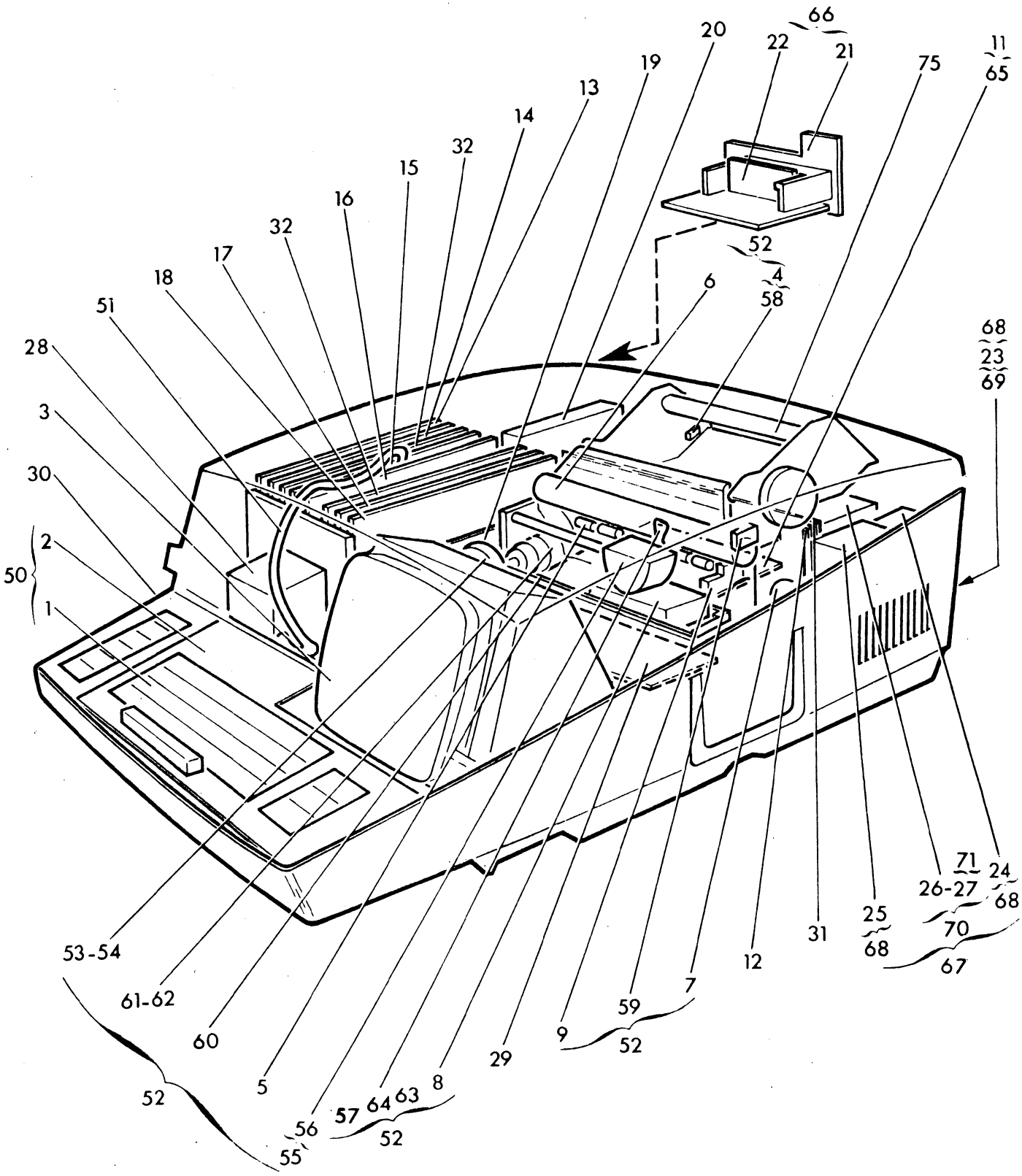


PLANCHE	00	TELEIMPRIMEUR	TX35
PLATE		*TELEPRINTER*	*TX35*
TABLA		TELEIMPRESOR	TX35
ABBILDUNG		*FERNSCHREIBER*	*TX35*

1	2	3 1 2 3 4 5 6 7	4		5
17A	23101693-0	CARTE MEMOIRE 16K(2114)	23101693-0	53840	01
17B	23103145-3	CARTE MEMOIRE 16K(6514)	23103145-3	53840	01
18	23101719-3	CARTE INDICATIF + COMMANDE ADAPTATION TELEGRAPHIQUE	23101719-3	53840	01
19	*********	CARTE ADAPTATION TELEGRAPHIQUE (VOIR DOCUMENT SPECIFIQUE)	*********	53840	01
20	23104439-8	AMPLIFICATEUR DE PUISSANCE	23104439-8	53840	01
	23059941-9	. VIS DE FIXATION	23059941-9	53840	01
66	*********	RACCORDEMENT D'EXPLOITATION ENSEMBLE	*********	53840	01
21	23103324-1	. RACCORDEMENT D'EXPLOITATION	23103324-1	53840	01
22	23103313-4	. CARTE PARAFOUDRE LIGNE	23103313-4	53840	01
67	*********	ALIMENTATION EQUIPEE	*********	53840	01
68	*********	. FILTRE SECTEUR	*********	53840	01
	15690102-0	. VIS A TOLE N4X6,5	E27131-4P65EDTL	50035	02
23	*********	. . PARAFOUDRE SECTEUR	*********	53840	01
69	23102181-6	. . . CARTE PARAFOUDRE SECTEUR	23102181-6	53840	01
	15630026-0	. . . VIS F/90 M2,5X8 AC.CL.5-6	E27113B25Q8QEUL	50035	02
24	23103480-0	. . PLATINE SECTEUR	23103480-0	53940	01
	15690102-0	. . VIS A TOLE N4X6,5	E27131-4P65EDTL	50035	02
	13270088-7	. . . FUSIBLE 5X20 1,25A	HA20-1U25	52745	01
25	23103861-3	. . FILTRE	23103861-3	53840	01
70	*********	. . BLOC ALIMENTATION	*********		01
	23059941-9	. . . VIS DE FIXATION	23059941-9	53840	02
26	23103155-2	. . . CARTE ALIMENTATION	23103155-2	53840	01
	15600050-0	. . . VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	02
27	*********	. . . CAPOT ET RADIATEUR DU BLOC ALIMENTATION	*********		01
71	23104380-4	. . . . RADIATEUR	23104380-4	53840	01
	15600062-5	. . . . VIS CHC M3X25 AC.CL.8-8	E27161-30M25QVUL	50035	04
28	23104441-8	BATTERIE	23104441-8	53840	01
	15600050-0	VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	01
29	23104452-5	PLAQUE MERE	23104452-5	53840	01
	15600050-0	VIS CHC M3X8 AC.CL.8-8	E27161-30Q8QVUL	50035	01
	15700306-8	RONDELLE DE3 XC65	E27618E30AXTL	50035	01
	15700257-4	RONDELLE M3U AC.A33	E27611M30AAUL	50035	01
72	23104991-8	CORDON DE MASSE	23104991-8	53840	01
30	*********	CAPOTAGE	*********	53840	01
73	23104345-8	. VIS DE FIXATION DE L'ECRAN DE VISUALISATION	23104345-8	53840	01
74	23109985-6	. SUPPORT DE CARTE MERE	23109985-6	53840	01
	15600058-4	. VIS CHC M3X16 AC.CL.8-8	E27161-30M16QVUL	50035	05
	15700257-4	. RONDELLE M3U AC.A33	E27611M30AAUL	50035	05
75	23079734-6	SUPPORT DE ROULEAU DE PAPIER	23079734-6	53840	01
76	23106919-2	DEFLECTEUR DE PAPIER PAGE	23106919-2	53840	01
31	23104675-1	CARTE MPU IMPRIMANTE	23104675-1	53840	01
77	*********	LOGICIEL IMPRIMANTE(REFERENCE ECRITE SUR 4IEME LIGNE DE LA PLAQUE CONSTRUCTEUR)	*********	53840	01
78	*********	. MEMOIRE PROGRAMMEE (REFERENCE ECRITE SUR LE COMPOSANT) Z4	*********	53840	01
79	*********	MEMOIRE PROGRAMMEE (REFERENCE ECRITE SUR LE COMPOSANT) Z5	*********	53840	01
80	*********	MEMOIRE PROGRAMMEE (REFERENCE ECRITE SUR LE COMPOSANT) Z7	*********	53840	01
32	23104738-1	CARTE MPU 28K	23104738-1	53840	02
81	*********	LOGICIEL MPU(REFERENCE ECRITE SUR 3 IEME LIGNE DE LA PLAQUE CONSTRUCTEUR)	*********	53840	02
82	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z1	*********	53840	02
83	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z2	*********	53840	02
84	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z5	*********	53840	02
85	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z6	*********	53840	02
86	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z8	*********	53840	02
87	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z9	*********	53840	02
88	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z11	*********	53840	02
89	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z12	*********	53840	02
90	*********	MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) Z16	*********	53840	02

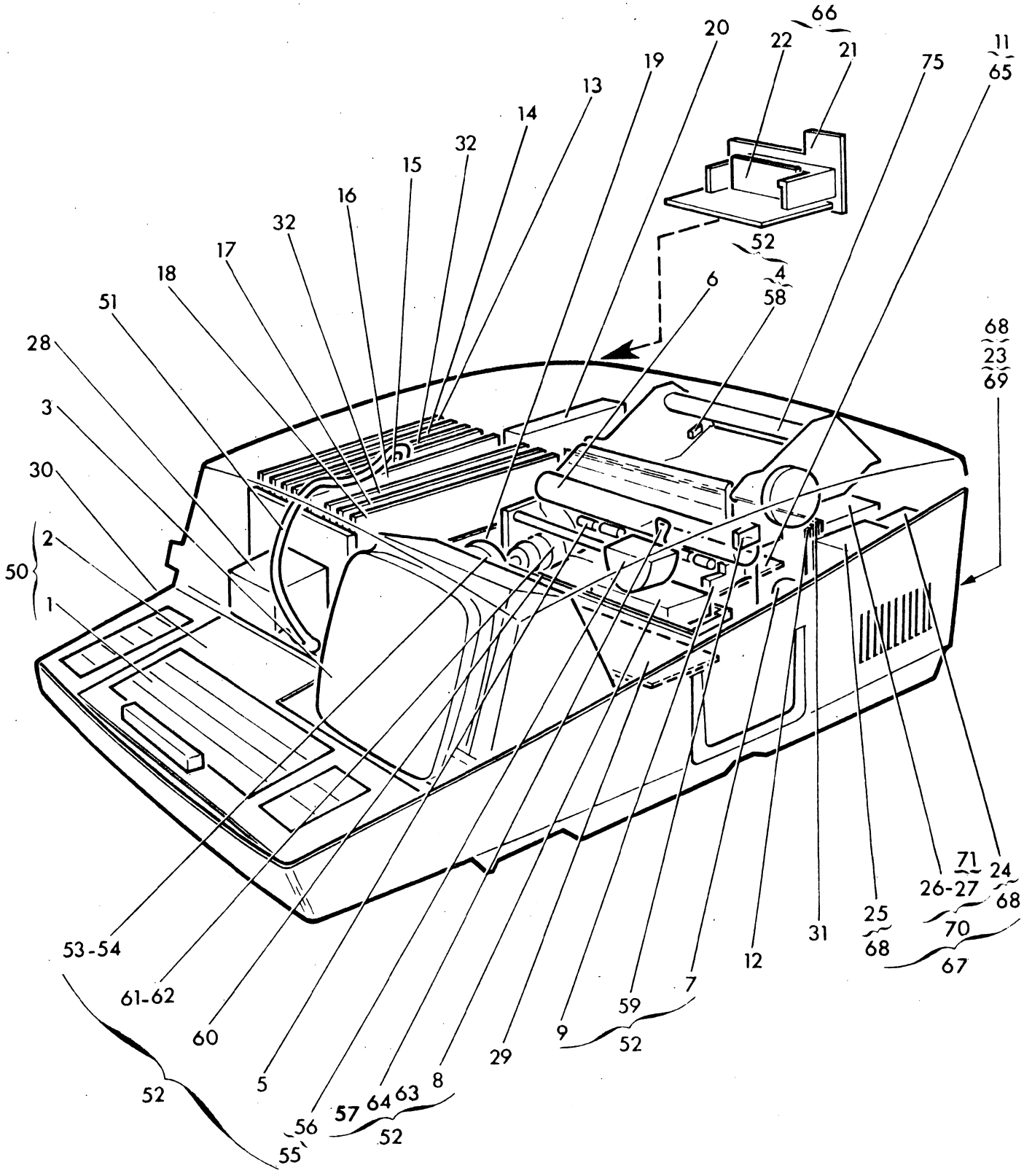


PLANCHE	00	TELEIMPRIMEUR	TX35
PLATE		*TELEPRINTER*	*TX35*
TABLA		TELEIMPRESOR	TX35
ABBILDUNG		*FERNSCHREIBER*	*TX35*

1	2	3 1 2 3 4 5 6 7	4		5
-91	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) ... Z17	*********	53840	02
-92	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) ... Z19	*********	53840	02
-93	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) ... Z20	*********	53840	02
-94	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) ... Z23	*********	53840	02
-95	*********	. MEMOIRE PROGRAMMEE(REFERENCE ECRITE SUR LE COMPOSANT) ... Z24	*********	53840	02
-96	*********	LOGICIEL GENERATEUR DE CARACTERES	*********		01

REPERTOIRE DES FABRICANTS

INDEX OF MANUFACTURERS

REPERTORIO DE LOS FABRICANTES

VERZEICHNIS DER HERSTELLER

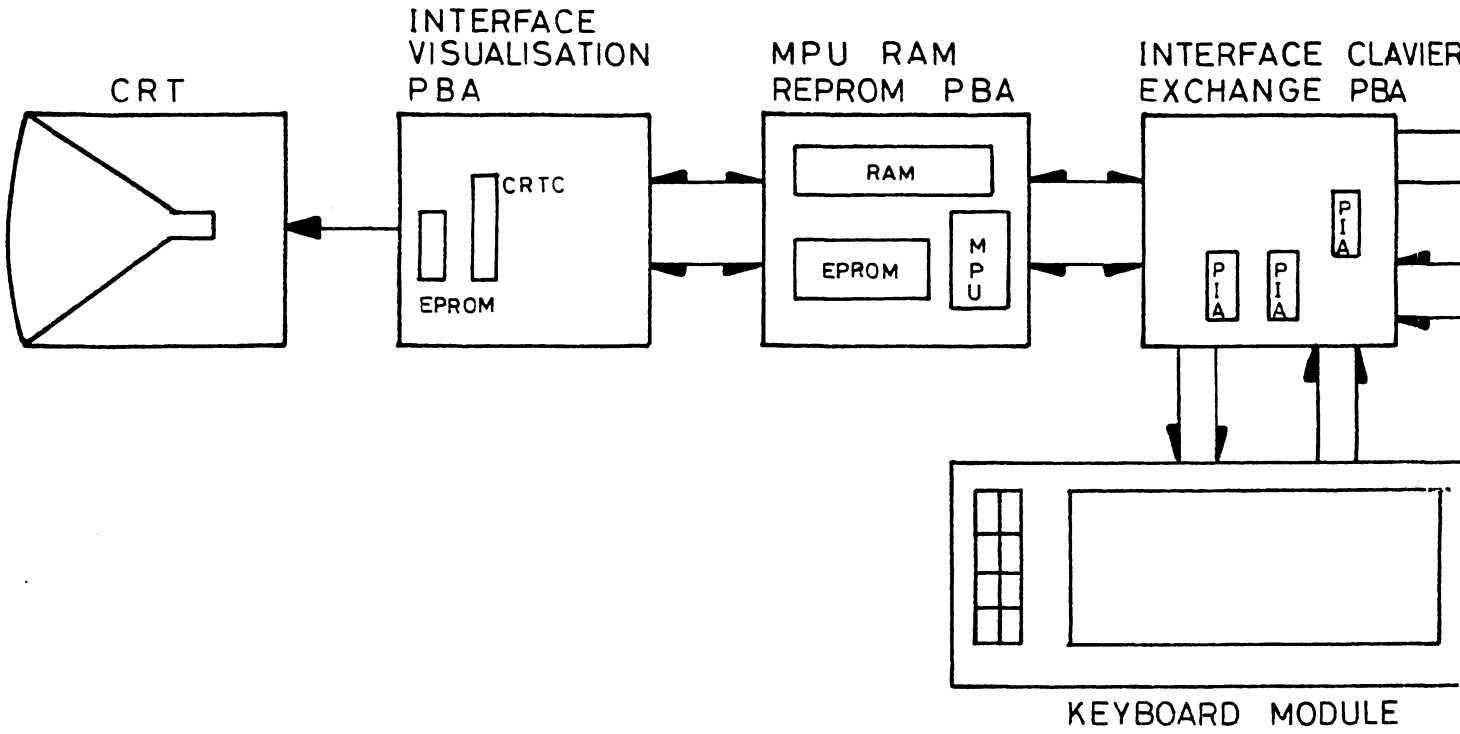
1	2
	SAGEM SA (STE D'APPLICATIONS GENERALES D'ELECTRICITE ET DE MECANIQUE) 6 AVENUE D'IENA 75783 PARIS CEDEX 16 FRANCE
7155	GOODYEAR TIRE AND RUBBER CO 1144 E MARKET AKRON OH 44316 USA
7538	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876 USA
10072	SILEC (STE INDUSTRIELLE DE LIAISONS ELECTRIQUES) SA 64 BD DE MONCEAU 75008 PARIS FRANCE
18767	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051 USA
50023	SAFT (STE DES ACCUMULATEURS FIXES ET DE TRACTION) DPT PILES SAFT LECLANCHE. 156 AVENUE DE METZ 93230 ROMAINVILLLE FRANCE
50035	AFNOR (ASSOCIATION FRANCAISE DE NORMALISATION) TOUR EUROPE 92080 PARIS LA DEFENSE CEDEX 7 FRANCE
50075	AMP DE FRANCE DIV.AMPLIVERSAL 29 CHAUSSEE JULES CESAR 95301 PONTOISE FRANCE
50095	APEX (L'AMORTISSEUR) 4 RUE DUHESME 75018 PARIS FRANCE
50112	A.D.R LES APPLICATIONS DU ROULEMENT 1 AVENUE NEWTON 92140 CLAMART FRANCE
50116	APR (APPAREILLAGE PROFESSIONNEL RADIO ELECTRONIQUE) ANCIENS ETS JEAN ROGERO 82270 MONTPEZAT DE QUERCY FRANCE
50297	BNAE (BUREAU DE NORMALISATION DE L'AERONAUTIQUE ET DE L'ESPACE) 8 RUE MOREAU VAUTHIER 92100 BOULOGNE BILLANCOURT FRANCE
50337	COMATEL (COMPTOIR EUROPEEN DE MATERIEL ELECTRONIQUE) SA 26500 BOURG LES VALENCES FRANCE
50614	CROUZET SA 128 AVENUE DE LA REPUBLIQUE 75011 PARIS. FRANCE
50711	DOMANGE (ETS) SA 198 AV.DES GRESILLONS 92206 ASNIERES FRANCE
50797	SFERNICE ELECTRO-RESISTANCE) 59 RUE GUTEMBERG 75737 PARIS CEDEX 15 FRANCE
50850	SEEM (STE D'ETUDES ELECTRO-MECANIQUES) SARL 15 AVENUE VICTOR HUGO 92170 VANVES FRANCE

1	2
50952	FORGOS (ETS) SARL 28 BD BARBES 92120 MONTROUGE FRANCE
51148	HEWLETT-PACKARD CO CORPORATE HQ 1501 PAGE MILL RD PALO ALTO CA 94304 USA
51201	INA-ROULEMENTS SA ROUTE DE BITCHE 67501 HAGUENAU FRANCE
51241	JEANRENAUD (DEPARTEMENT ELECTROCOMMUTATION) B.P.359 39105 DOLE FRANCE
51254	LE JOINT FRANCAIS SARL 10 RUE DE LA BAUME 75008 PARIS FRANCE
51350	L.C.C-C.I.C.E (CIE EUROPEENNE DE COMPOSANTS ELECTRONIQUES) SA 36 AVENUE GALLIENI 93170 BAGNOLET FRANCE
51464	MANUFACTURE FRANCAISE D'OEILLETS METALLIQUES SA 5 RUE DE DUNKERQUE 75010 PARIS FRANCE
51530	MECANINDUS (STE) 54 RUE LOUIS BLANC 92400 COURBEVOIE FRANCE
51596	MICRO SA BOULEVARD DE BORD DE MER PRINCIPAUTE DE MONACO
51689	NOMEL (NOUVEAUTES MECANIQUES ELECTRIQUES) TOUR FRANKLIN CEDEX 11 92081 PARIS LA DEFENSE FRANCE
51747	OEC (OUEST ELECTRONIC CONNECTEURS) SA 5 RUE DE LA FAUVETTE 95102 ARGENTEUIL FRANCE
51918	PRONER (ETS) SA B.P. 31 93160 NOISY LE GRAND FRANCE
51950	RADIAL SA 101 RUE PHILIBERT HOFFMANN Z.I. 93110 ROSNY SOUS BOIS FRANCE
51956	R.T.C LA RADIOTECHNIQUE COMPELEC SA DIV RESISTANCES ET CONDENSATEURS 51 RUE CARNOT 92150 SURESNES FRANCE
52116	SECME (STE D'ETUDES ET DE CONSTRUCTION DE MATERIEL ELECTRONIQUE) SA 88 AVENUE GALLIENI 93170 BAGNOLET FRANCE
52169	SIC-SAFCO (LES CONDENSATEURS) SA 91 RUE DE BELLEVUE 92704 COLOMBES FRANCE
52183	SSC SILICIUM SEMICONDUCTEUR SA 45 RUE DE MONCEAU 75008 PARIS FRANCE
52270	SOURIAU ET CIE SA DIVISION CONNEXION ET SPATIAL 13 RUE DU GENERAL GALLIENI 92130 BOULOGNE BILLANCOURT FRANCE

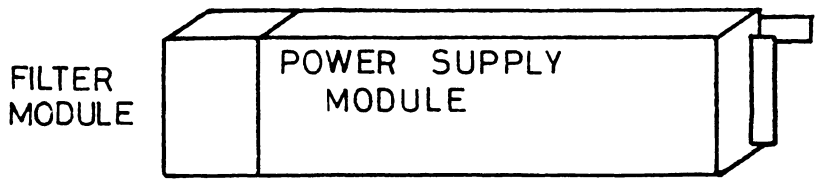
1	2
52310	SES (STE ELECTRIQUE STERLING) 1 RUE DELEMONT 68300 ST LOUIS FRANCE
52367	TEXAS INSTRUMENTS - FRANCE SA 06270 VILLENEUVE LOUBET FRANCE
52412	TRELEC SARL 2 RUE DE L'AGRICULTURE 95110 SANNOIS FRANCE
52483	VIBRACHOC SA 216 BUREAUX DE LA COLLINE 92213 ST.CLOUD FRANCE
52499	VIRAX SA B.P. 197 51321 EPERNAY FRANCE
52745	UTE (UNION TECHNIQUE DE L'ELECTRICITE) CCTU (COMITE DE NORMALISATION DU COMITE DE COORDINATION DES TELECOMMUNICATIONS) 12 PL DES ETATS UNIS 75783 PARIS CEDEX FRANCE
52746	ACCEL (ACCESSOIRES ELECTRONIQUES) SA 35 RUE DE LA MARE 75020 PARIS FRANCE
53072	EUROFARAD SA 92 RUE OBERKAMPF 75011 PARIS FRANCE
53127	HELLERMANN FRANCE SA 34 RUE GAETAN LAMY TOUSSUS LE NOBLE 75530 BUC FRANCE
53573	LOUPOT-CIE (ETS J.) SA ROUTE DE CONCARNEAU 29000 QUIMPER FRANCE
53735	SAVIGNY SA 938 AVENUE SAINT JUST 77530 VAUX LE PENIL FRANCE
54330	HARRIS MFG CO INC ST LOUIS MO USA
54515	CLARE INTERNATIONAL NV OVERHAAMLAAN 3700 TONGEREN BELGIQUE
54636	CELDUC (CONSTRUCTIONS ELECTRIQUES DU CENTRE) SA 42290 SORBIERS FRANCE
55242	COMEPA 34 RUE JACQUART 93500 PANTIN FRANCE
55326	GENERAL ELECTRIC SEMICONDUCTOR PRODUCT DEPARTEMENT ELECTRONICS PARK SYRACUSE NY 13221 USA
55626	INTEL FRANCE 74 RUE D'ARCUEIL 94528 RUNGIS CEDEX FRANCE
56184	METAFIX (STE) SA RUE EUGENE GAZEAU 60300 SENLIS FRANCE
56637	MOTOROLA INC SEMICONDUCTOR PRODUCTS DIV P O BOX 20923 5005 MCDOWELL RD PHOENIX AZ 85036 USA
56876	TEKELEC-AIRTRONIC B.P.2 92310 SEVRES FRANCE

1	2
57249	RIFA SA BOULEVARD DE LA LIANE 62206 BOULOGNE SUR MER FRANCE
58852	MOSTEK FRANCE 30 RUE DU MORVAN SILIC 471 94613 RUNGIS CEDEX FRANCE
59191	FRANCE CONNEXION SARL 14 RUE DE FONTENAY 94300 VINCENNES FRANCE
59582	AMI MICROSYSTEMS 124 AVENUE DE PARIS 94300 VINCENNES FRANCE
59705	FAIRCHILD CAMERA AND INSTRUMENTS CORP SEMICONDUCTOR DIV 464 ELLIS ST MOUNTAIN VIEW CA 94042 USA
99992	SPECTROL ELECTRONICS CORP 17070 E GALE AVE CITY OF INDUSTRY CA 917745 USA
99993	ELEC-TROL 26477 NORTH GOLDEN VALLEY ROAD SANGUS CALIFORNIA 91350 USA
99994	LEGRAND (STE) SA 128 AV MARECHAL DE LATTRE DE TASSIGNY 87011 LIMOGES CEDEX FRANCE
99995	ITT CANNON ELECTRIC 666 E DYER RD SANTA ANA CA 92702 USA
99996	SCHURTER AG H WERKHOFSTER 8 CH 6002 LUZERN LU SUISSE
99997	SGS UNITED KINGDOM LTD PLANAR HOUSE WALTON STREET AYLESBURY BUCKS UNITED KINGDOM
99999	SCHNORR,ADOLF,KG 7434 MAICHINGEN STUTTGARTER STRASSE RFA
99998	S S S SOLID STATE SCIENTIFIC,INC., MONTGOMERYVILLE INDUSTRIAL CENTER, MONTGOMERYVILLE PA 18936 USA

SAGEM TX35 TELEPRINTER
Block diagram



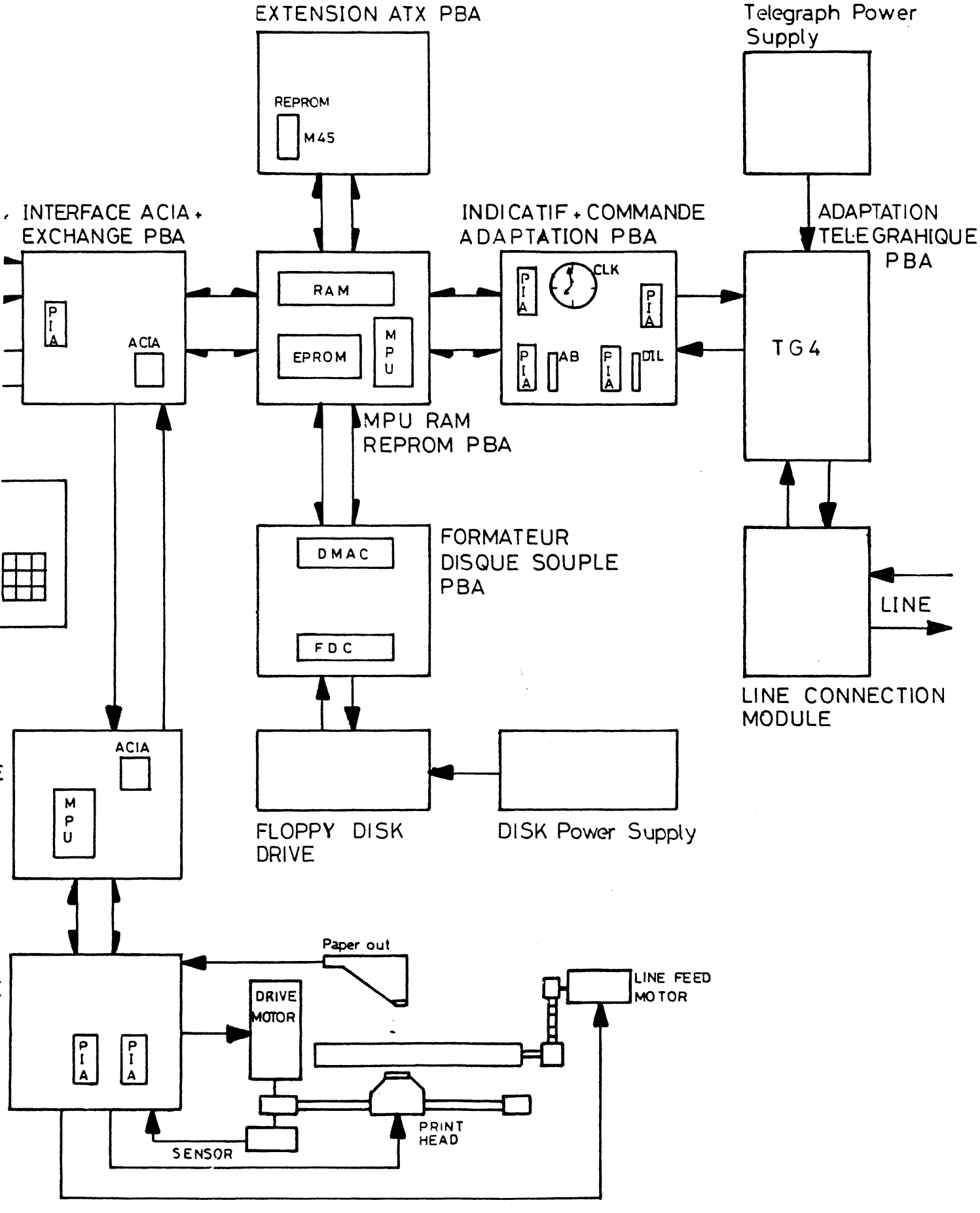
MPU
IMPRIMANTE
PBA

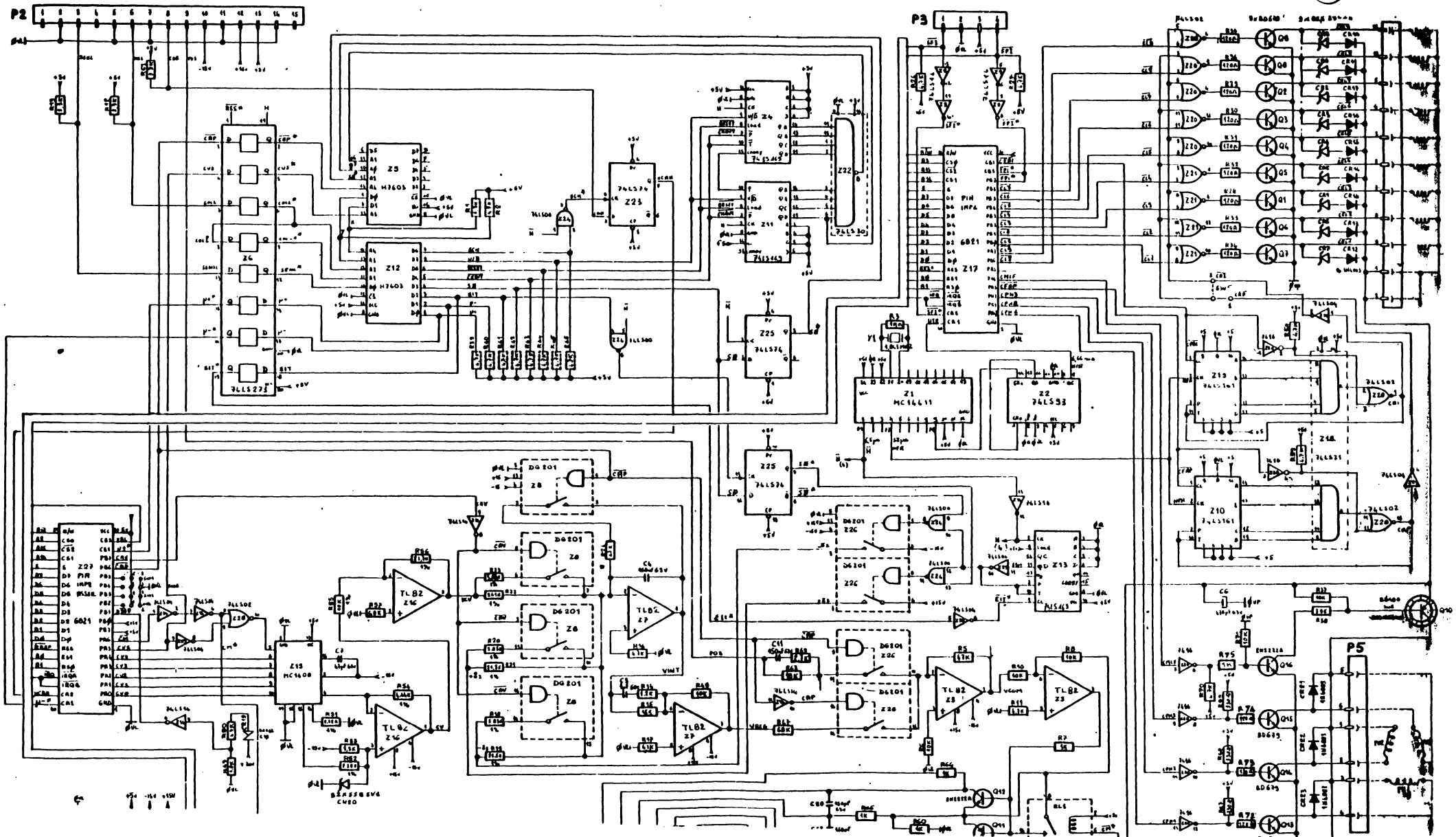


INTERFACE
IMPRIMANT
PBA

LEGEND

ACIA	Asynchronous Communication Interface Adaptor
AB	Answerback PROM
CLK	Clock generator
DIL	Dual in Line switches
EPROM	Erasable Programmable Ready Only Memory
MPU	Micro Processor Unit
PBA	Printed Board Assembly
PIA	Peripheral Interface Adaptor
RAM	Random Access Memory


EXTENSION ATX PBA
REPROM
M45
Telegraph Power Supply
INTERFACE ACIA + EXCHANGE PBA
PIA
ACIA
RAM
EPROM
MPU
INDICATIF + COMMANDE ADAPTATION PBA
CLK
PIA
AB
DIL
ADAPTATION TELEGRAHIQUE PBA
TG4
MPU RAM REPROM PBA
DMAC
FDC
FORMATEUR DISQUE SOUPLE PBA
LINE
LINE CONNECTION MODULE
FLOPPY DISK DRIVE
DISK Power Supply
Paper out
DRIVE MOTOR
LINE FEED MOTOR
PRINT HEAD
SENSOR


P2
P3
P5
Z5
Z6
Z12
Z22
Z23
Z24
Z11
Z25
Z17
Z1
Z2
Z13
Z14
Z10
Z27
Z15
Z16
Z7
Z8
Z26
Q1
Q2
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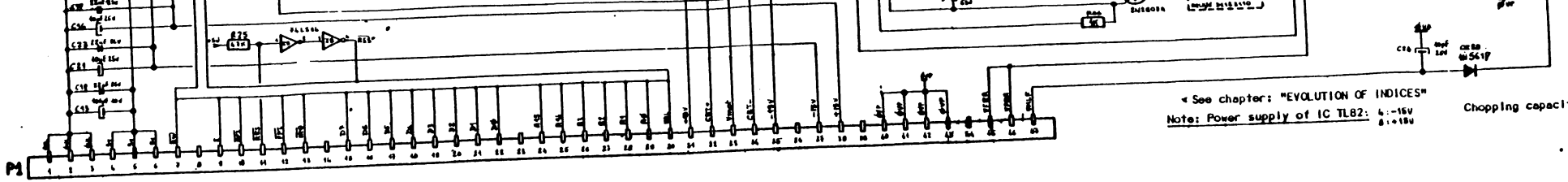
Q13
Q14
Q15
Q16



* See chapter: "EVOLUTION OF INDICES"

Note: Power supply of IC TL82: 4:-15V
8:+18V

Chopping capacitors: C5, C8, C9, C10
C14, C15, C17, C
22 nF, 25 V

9/July -

Telegraphs
North Sydney.

SAGEM TX35
COURSE HANDBOOK

TELEX 2000

Telecom Australia
ENGINEERING TRAINING SECTION
SERVICES BRANCH N. S. W.

Towards the Telex

Telecom will begin marketing later this month (September), its new premium telex, the Telex 2000.

The telex, formerly called the TX 35, has a range of features which are sure to prove attractive to major business customers.

The telex was given the name change recently to reinforce to prospective users the concept that it is the telex of the future.

One of the most striking features of the Telex 2000 is its built-in visual display unit. This is used to produce material for transmission in much the same way as a word processor is operated.

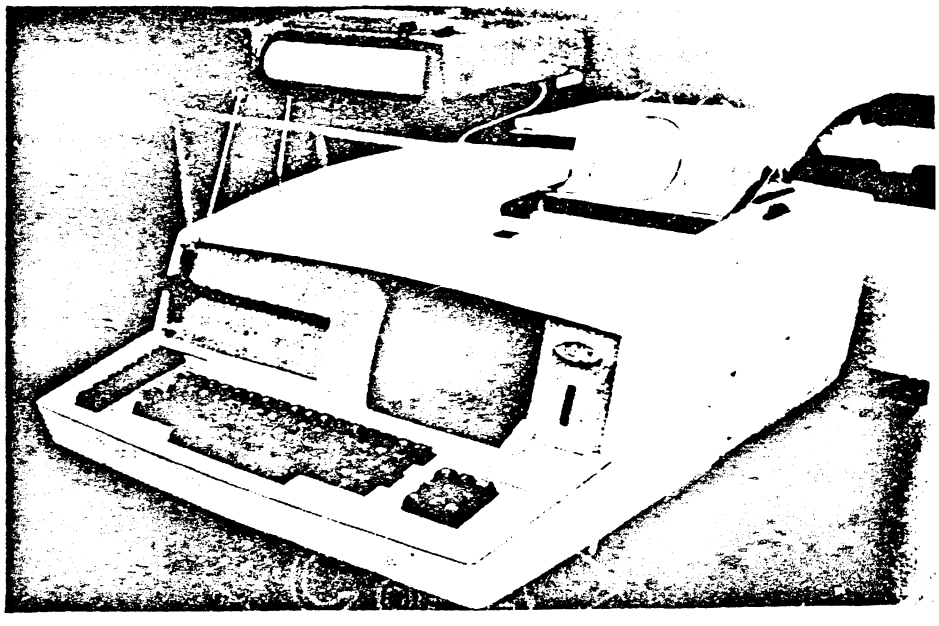
Marketing of two models will begin in Melbourne and Sydney on September 26.

The first model, selling for $5950 (annual rental $2700), has a 32,000 character electronic memory.

The second model, selling for $6950 (annual rental $3192), has the same 32,000 character electronic memory, plus a 115,000 character floppy disc memory.

Other features include:

- Automatic dialling.
- Abbreviated number calling (feature in which 20 often called telex numbers can be stored).
- Multiple addressing.
- Protected formatting (text can be protected and in no way altered when set).
- Deferred delivery (messages can be prepared and programmed to be transmitted up to 14 hours ahead).
- Automatic clearing (no need for operators to wait to clear call).
- Full tabulation (three types of tabulation are programmed — 5 space tabulation, selective tabulation and decremental tabulation for figure groups in particular).



SECTION INDEX

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FLOPPY DISK

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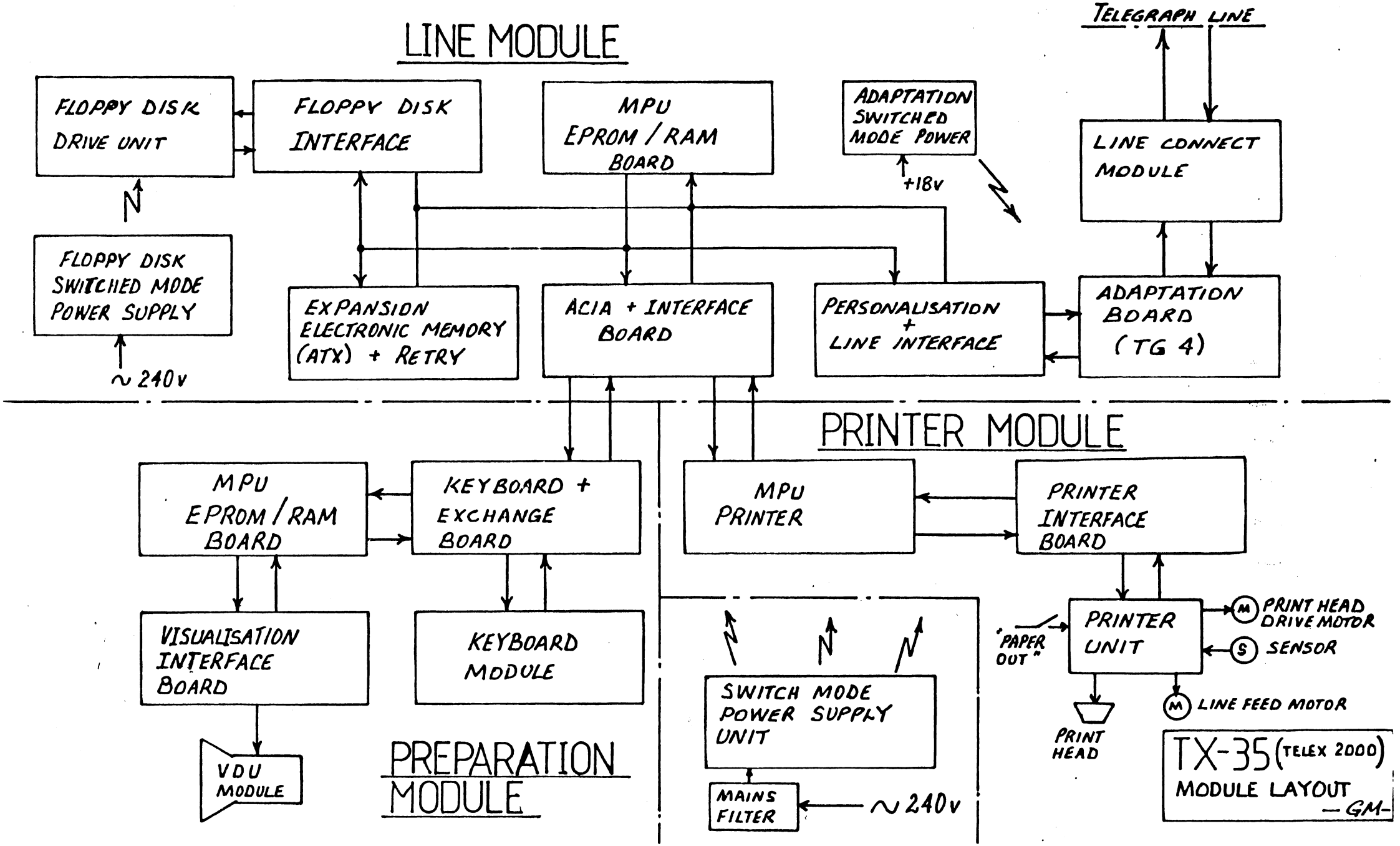
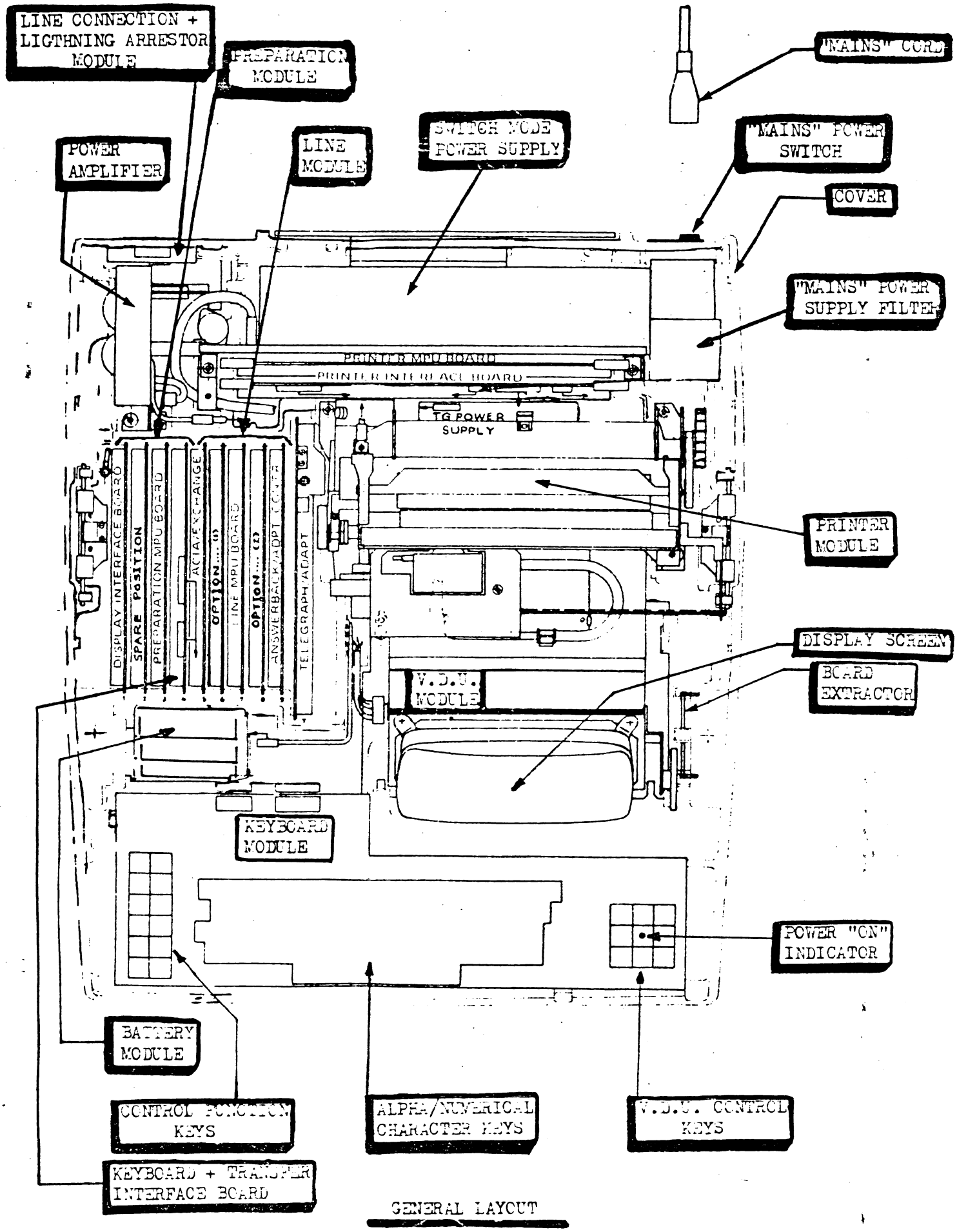
SWITCH AND STRAP SETTIEGS

GENERAL LAYOUT

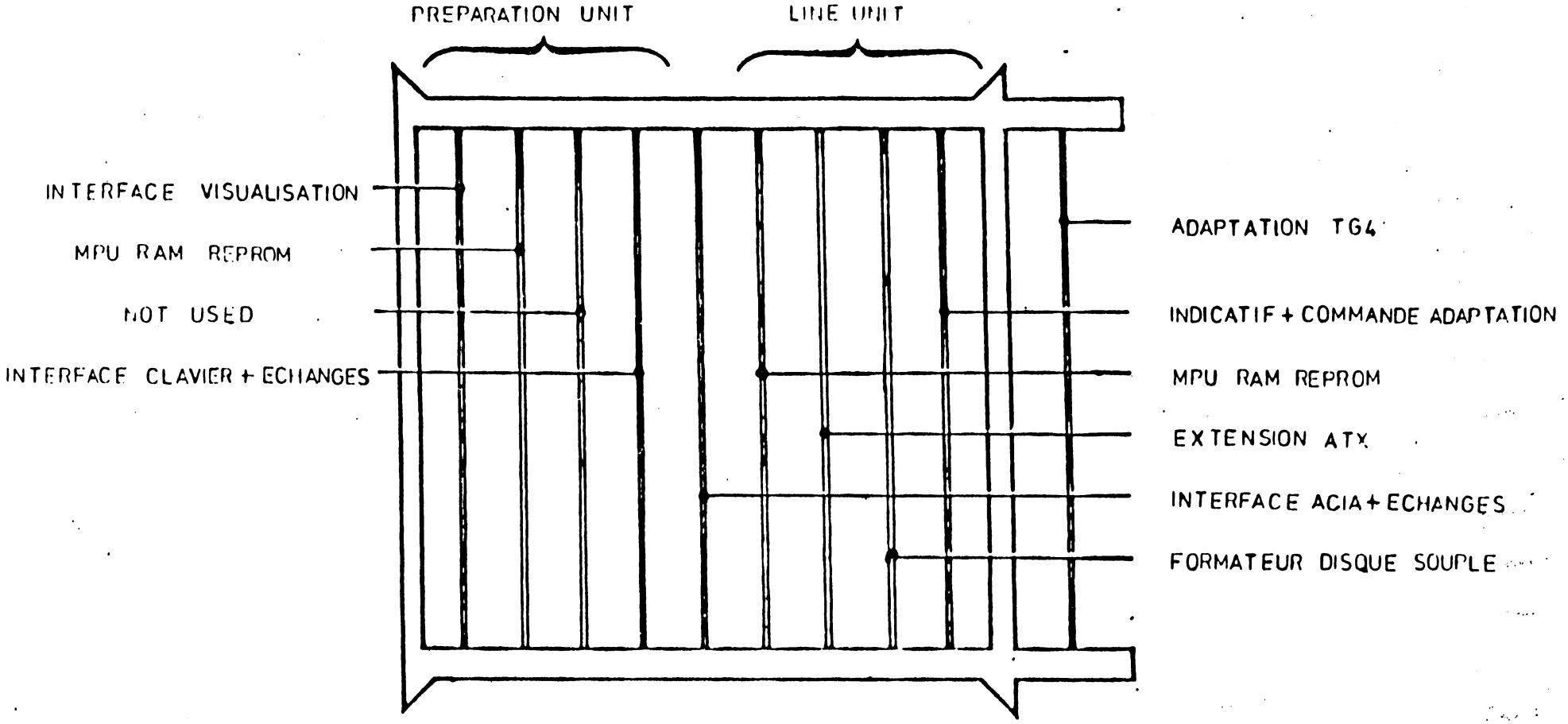

LINE MODULE
TELEGRAPH LINE
FLOPPY DISK DRIVE UNIT
FLOPPY DISK INTERFACE
MPU EPROM / RAM BOARD
ADAPTATION SWITCHED MODE POWER
+18V
LINE CONNECT MODULE
FLOPPY DISK SWITCHED MODE POWER SUPPLY
~ 240V
EXPANSION ELECTRONIC MEMORY (ATX) + RETRY
ACIA + INTERFACE BOARD
PERSONALISATION + LINE INTERFACE
ADAPTATION BOARD (TG 4)
PRINTER MODULE
MPU EPROM / RAM BOARD
KEYBOARD + EXCHANGE BOARD
MPU PRINTER
PRINTER INTERFACE BOARD
VISUALISATION INTERFACE BOARD
KEYBOARD MODULE
"PAPER OUT"
PRINTER UNIT
PRINT HEAD DRIVE MOTOR
SENSOR
LINE FEED MOTOR
PRINT HEAD
VDU MODULE
PREPARATION MODULE
SWITCH MODE POWER SUPPLY UNIT
MAINS FILTER
~ 240V
TX-35 (TELEX 2000)
MODULE LAYOUT
— GM —

OPTION... (1)
ATX + RETRY FACILITY BOARD

OPTION... (2)
FLOPPY DISC INTERFACE BOARD

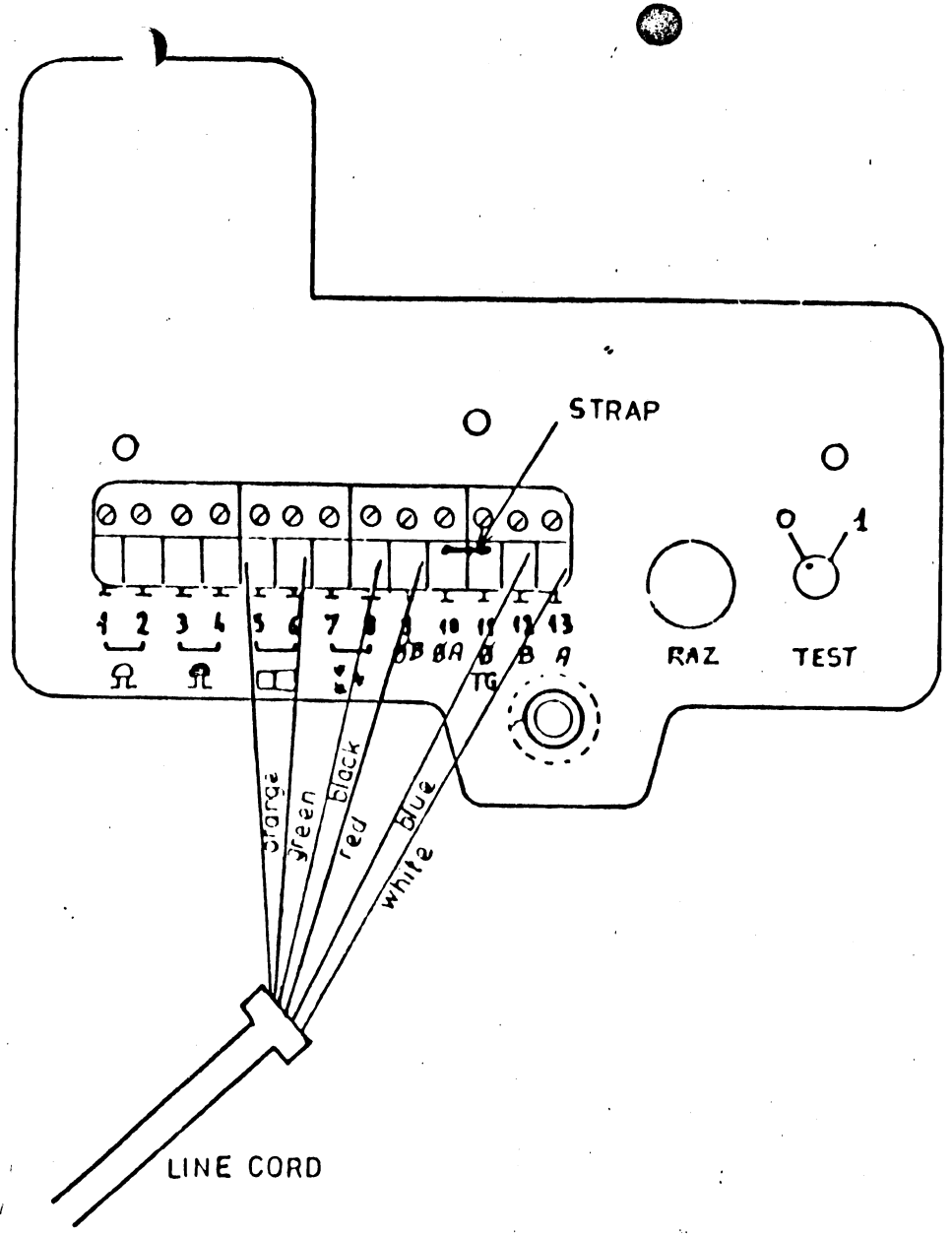


GENERAL LAYOUT



BOARD ASSEMBLY

LINE MODULE



RAZ PUSH BUTTON IS USED TO TRIGGER AUTOTEST .

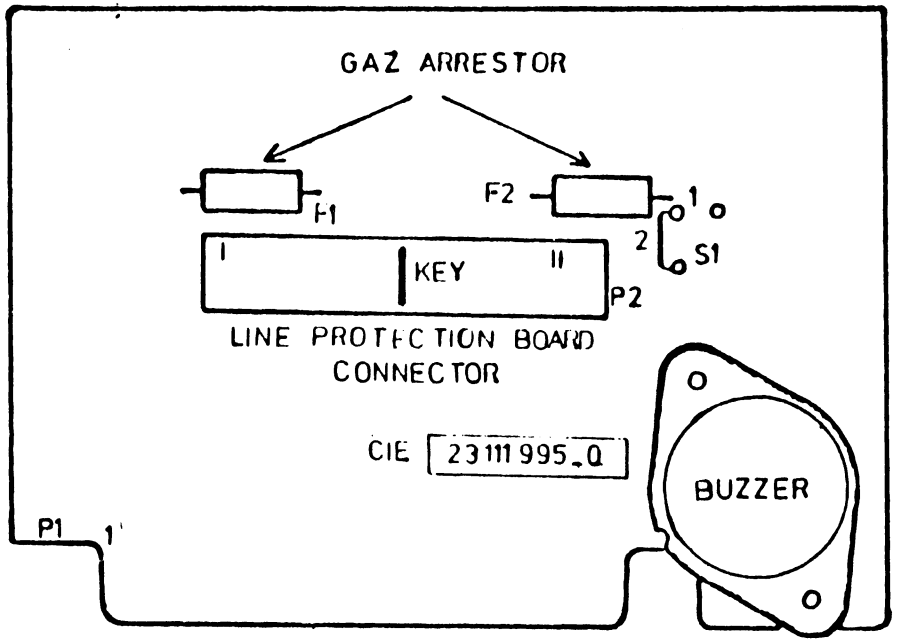
TEST 2 POSITION SWITCH IS USED TO:-

- POSITION 0 - NORMAL ON-LINE OPERATION
- POSITION 1 - RY TEST WHEN AUTOTEST IS PERFORMED

SWITCHING FROM 1 TO 0 STOPS RY TEST.

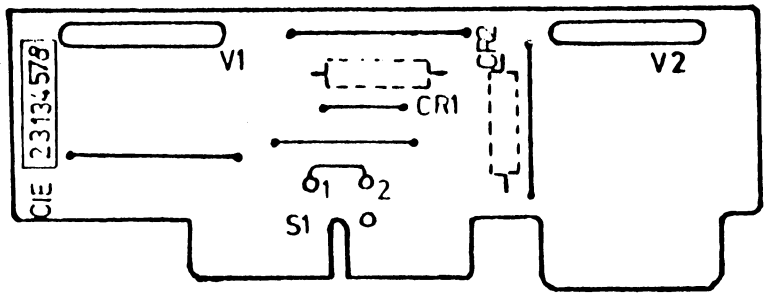
LINE CONNECTION MODULE

LINE CORD FITTING



LINE CONNECTION MODULE

MAIN BOARD



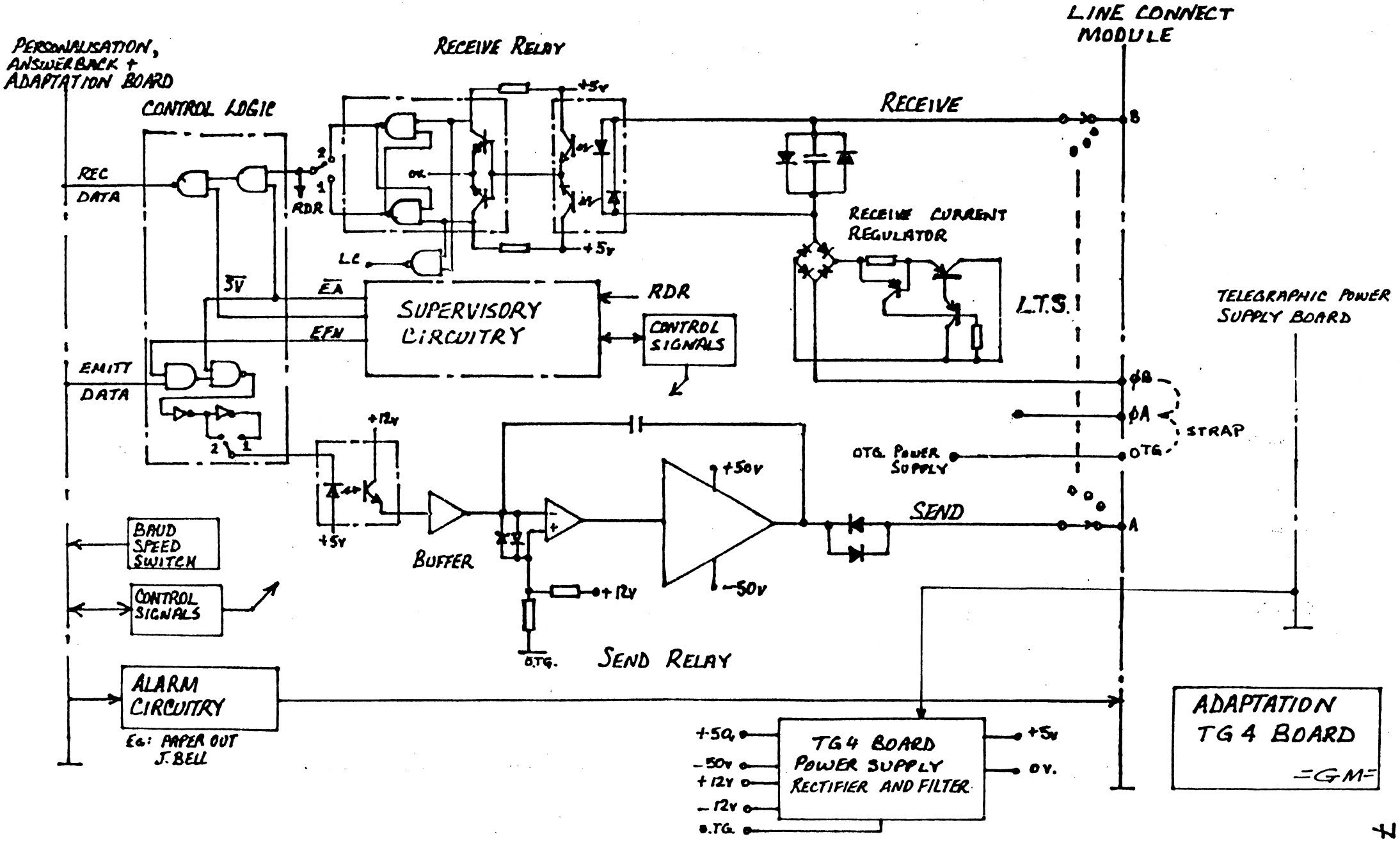
SWITCH S1 MUST BE IN POSITION 1

ZENER DIODE CR1 AND CR2 MUST NOT BE FITTED

VARISTOR V1 AND V2 MUST BE V 275_TYPE

LINE CONNECTION MODULE

LINE PROTECTION BOARD


PERSONALISATION, ANSWERBACK + ADAPTATION BOARD
CONTROL LOGIC
REC DATA
EMITT DATA
RDR
3V
EA
EFN
LC
SUPERVISORY CIRCUITRY
CONTROL SIGNALS
RDR
RECEIVE RELAY
+5v
+12v
BUFFER
+50v
-50v
+12v
O.TG.
SEND RELAY
BAUD SPEED SWITCH
CONTROL SIGNALS
ALARM CIRCUITRY
Eg: PAPER OUT
T. BELL
LINE CONNECT MODULE
RECEIVE
RECEIVE CURRENT REGULATOR
L.T.S.
SEND
φB
φA
STRAP
O.TG.
O.TG. POWER SUPPLY
TELEGRAPHIC POWER SUPPLY BOARD
TG4 BOARD POWER SUPPLY RECTIFIER AND FILTER
+50v
-50v
+12v
-12v
O.TG.
+5v
0v.
ADAPTATION TG4 BOARD
=GM=

INDICATIF + COMMANDE ADAPTATION BOARD

This board is used to interface between the line MPU and the telegraphic board (TG4), to give to the MPU the configuration of the TX35, to control transmission of answerback, and to provide the clock for acia operation and telegraphic speed. Signals to set the machine in stand-by mode $\overline{CVEI}$ and to awake teleprinter $\overline{SVEI}$ when a call is received are also generated on this board. The $\overline{SVEI}$ signal, and the $\overline{SVEI}$ from the interface clavier and echanges board are coupled together and sent to the P.S. The $\overline{CVEI}$ signal follows the same procedure.

FUNCTIONS PERFORMED ON THIS BOARD

This board is composed of the following integrated circuits :-

- 3 PIA Z13, Z14, and Z16
- 1 UART Z15
- 1 PROM Z12 (answerback chip)
- 1 Clock generator
- 4 X 2 positions switches SW0 to SW3
- 1 DIL switch SW4-8

PIA Z13

This PIA which is under the line MPU control is used to transmit the answerback on receipt of WRU code or when "here is" key is depressed. Register A (PA0 to PA4) is used to address the PROM memory Z12 and register B (PB0 to PB7) to collect the characters from the output of the PROM. Output PA7 is used to operate the buzzer.

PIA Z14

This PIA is used to interface with the clock. Register B is used as output register and allows the line MPU to set the time. Register A is used as an input to give the line MPU access to the current time. The clock is composed of 2 chips, Z1 (MM 53107), which is a series 17 stage oscillator/ divider, delivers a 60Hz frequency signal to Z8 MM 53105 which is a programmable TV timer. The clock gives only the time. The date is run by software.

PIA Z16

This PIA is used on two different functions. Register A is used to interface with the line during the connection and disconnection process. It also sends the alarm signals. Register B is mainly used to interface with the configuration switches (see table 1). The signal $\overline{\text{CVEI}}$ produced by the MPU to set the TX35 to stand-by mode is sent through this PIA to the power supply module.

CLOCK GENERATOR Z5

This circuit produces the different frequency signals for telegraphic purposes. It also produces a signal of 100Hz used as a real time clock used for telegraphic timing.

USART CIRCUIT 8251A Z15

This USART is used to serialize or deserialize the data coming from the MPU to the telegraphic board or coming from the TG4 board and going to the MPU.

SWITCHES

(A) Accessable by the operator

		To the front (A)	To the back (B
SW0	erase transmitted messages	no	yes
SW1	memorize incoming messages	no	yes
SW2	printer line feeds	single	double
SW3	line feed after clearing	2	6

(B) Accessable by technician

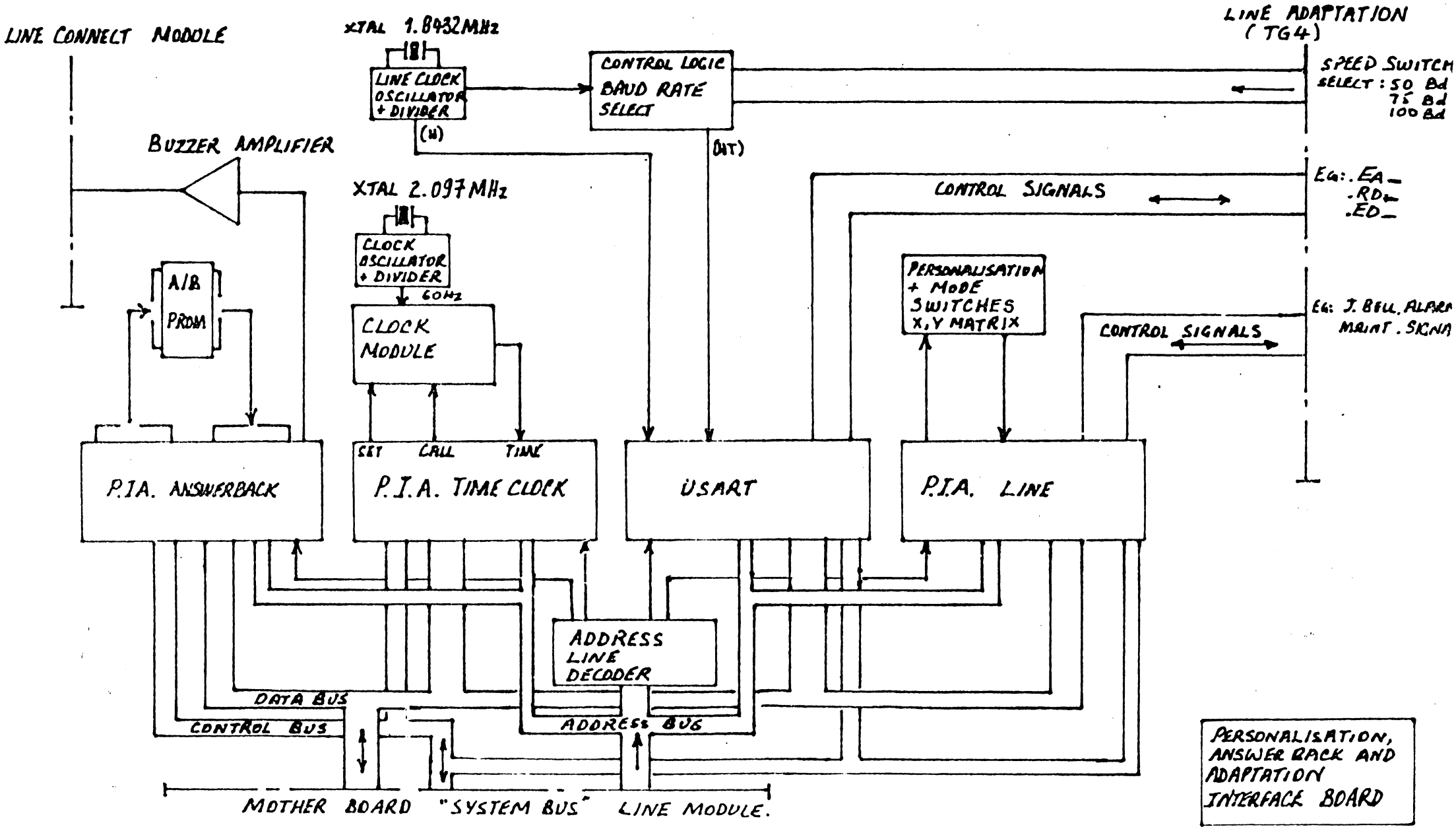
DIL SWITCH

POSITION	FUNCTION	0	1
1	disk operation	without	with
2	retry	without	with
3	audible alarm	permanent	momentary
4	answer back echange before transmission of message	with	without
5	type of numerotation	dialling code	telegraphic code
6	fig "D" memorisation	with	without
7	retry mode outgoing message priority	yes	no
8	telegraphic connection	2 wires	3 or 4 wires

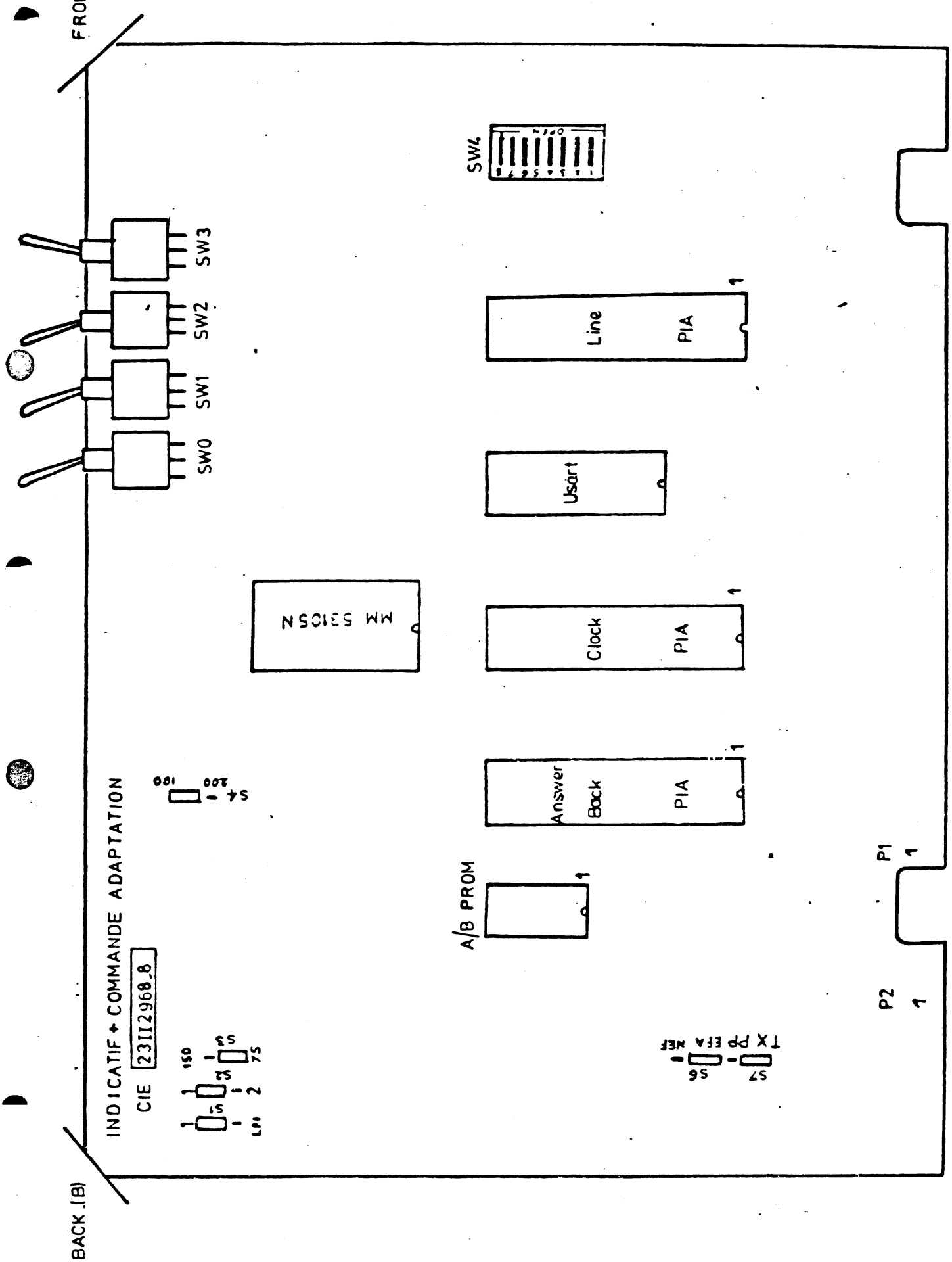
JUMPER	FUNCTION			
S1	punch/reader and printing unit		LPI	I *
S2	test of board at factory	normal operation	2	1 *
S3	speed modulation		75 *	150
S4	speed modulation		200	100 *
S5	private telex		PP	T X *
S6	automatic transmission of a end signal with,without		EFA	NEF *
S7	private telex		PP	TX *

COMMENTS

S1	-	punch (not available)
S2	-	when jumper on position 2, clock is provided by test equipment
S3 & S4	-	speed 50 BD is directly connected.
	-	jumper S3 allows to have a speed of 75BD or 150 BD when TG4 is set for 75 BD.
	-	jumper switch S4 allows to have a speed of 100BD or 200 BD when TG4 switch is set for 100 BD.
S5	-	to allow operation on private network software must be changed.
S6	-	automatic transmission is for special application
S7	-	see S5


LINE CONNECT MODULE
XTAL 1.8432MHz
LINE CLOCK OSCILLATOR + DIVIDER
(4)
CONTROL LOGIC
BAUD RATE SELECT
(11)
LINE ADAPTATION (TG4)
SPEED SWITCH
SELECT : 50 Bd
75 Bd
100 Bd
BUZZER AMPLIFIER
XTAL 2.097MHz
CLOCK OSCILLATOR + DIVIDER
60Hz
CLOCK MODULE
CONTROL SIGNALS
Eg: .EA_
.RD_
.ED_
A/B PROM
PERSONALISATION + MODE SWITCHES X,Y MATRIX
Eg: J. BELL. ALARM
MAINT. SIGNA
CONTROL SIGNALS
SET
CALL
TIME
P.I.A. ANSWERBACK
P.I.A. TIME CLOCK
USART
P.I.A. LINE
ADDRESS LINE DECODER
DATA BUS
CONTROL BUS
ADDRESS BUS
MOTHER BOARD "SYSTEM BUS" LINE MODULE.
PERSONALISATION, ANSWER BACK AND ADAPTATION INTERFACE BOARD

INDICATIF + COMMANDE ADAPTATION BOARD
LINE UNIT



MPU - RAM/REPROM BOARD

This board is used in both the preparation unit and the line unit. The board by itself is the same for prep and line, the differences are at the level of the software and strap. This board is the heart of the unit in which it is fitted. Located on the board are the microprocessor (6800), the software contained in the 2764 Eprom memories, the 8 2K RAM memories (6526) and a circuit to insure a proper operation of the DMA cycle. This circuit is only used when the board is allocated to the preparation unit, the CRTC being the user.

. The microprocessor is a 6800. Its clock is obtained from a 15MHz crystal control oscillator. A circuit composed of 2 JK flipflops (74LS112) interrupts the MPU through its DBE input when a direct memory access is requested by the CRTC. When used as a line MPU RAM/REPROM board there is no interruption of cycle.

. Memory type 2764 is used to store the software. This memory is 8K BYTES. 5 memories are used for the line software MEF to M67 (40K BYTES) and 4 memories are used for the preparation software MEF to M89 (32K BYTES). Two straps are provided to indicate if the memories M67 and M45 are fitted on the board. Presently, only the line module is equipped with a M67 memory and so the S67 strap must be fitted.

. Part of the message memory is also on this board. There is 16K BYTES of RAM. The 4 first K BYTES are allocated to the MPU as working memory (Z3 and Z4) so 12K are available as message storage (Z5 to Z10). The other message memories are on the ATX board, plugged alongside the MPU board.

SWITCHES

S2

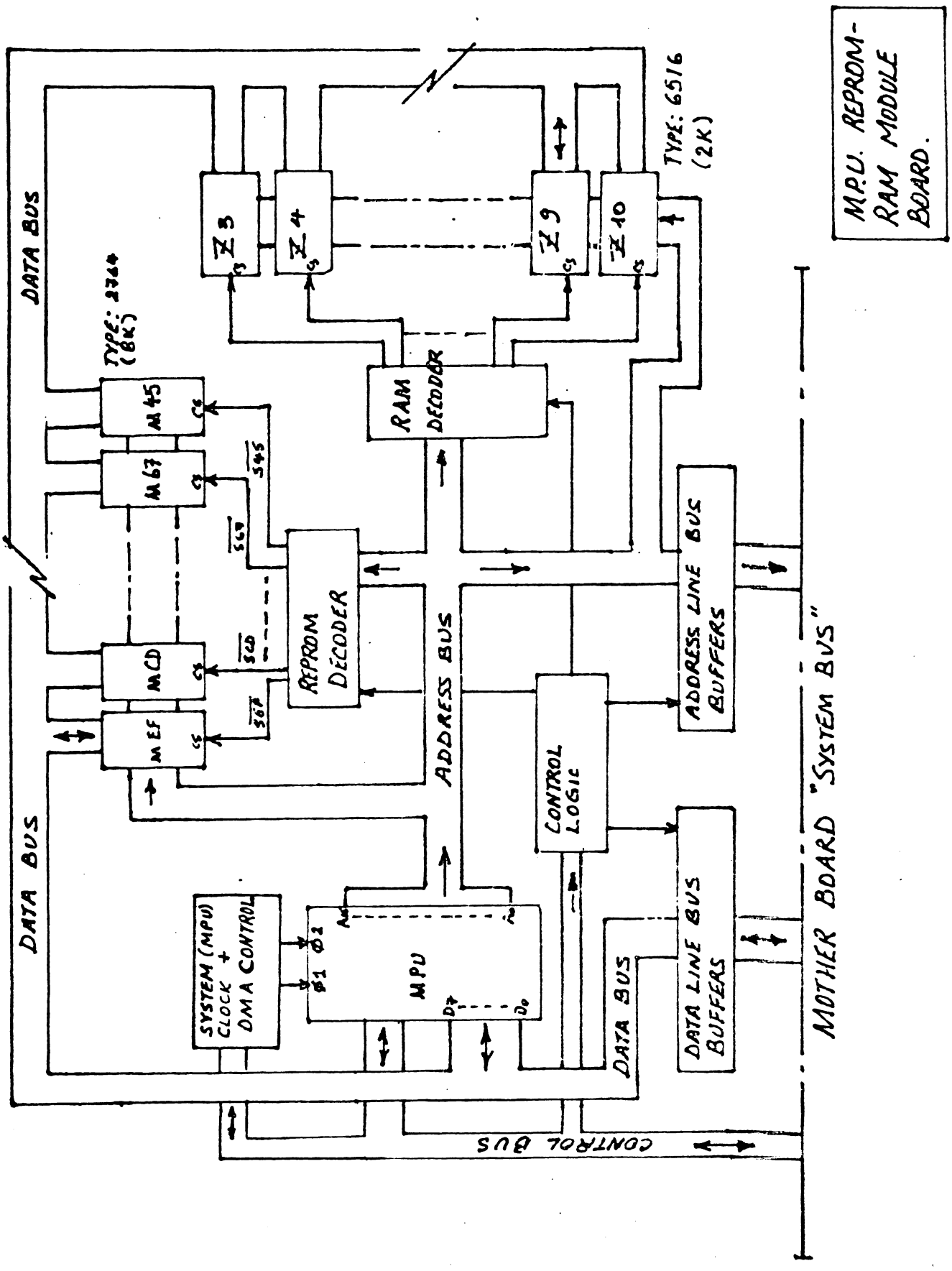
In position **2**, it allows the test equipment to clock the board when tested at the factory. In position **1** the board oscillator is connected. It is the normal position when fitted in the machine.

S1 and S3

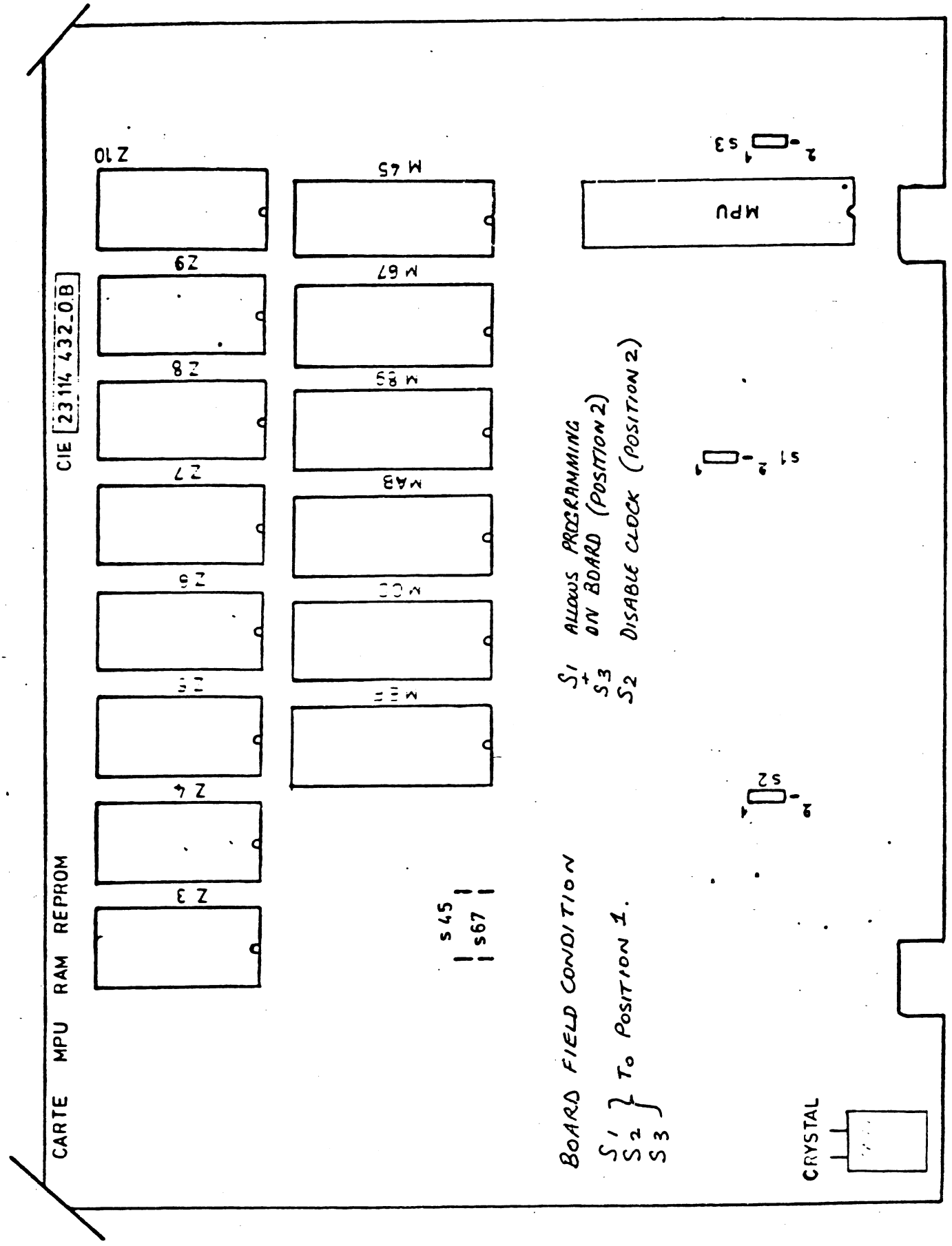
In position 2 it allows the REPROM memories to be programmed on board with a special tool. In position **1** it allows the normal operation of the board.

S67 and S45

Must be fitted when the memories M67 and M45 are used.


M.P.U. REPROM-RAM MODULE BOARD.
MOTHER BOARD "SYSTEM BUS"
DATA BUS
ADDRESS BUS
CONTROL BUS
TYPE: 2364 (8K)
TYPE: 6516 (2K)
Z3
Z4
Z9
Z10
M45
M47
M CD
M EF
RAM DECODER
REPROM DECODER
ADDRESS LINE BUS BUFFERS
DATA LINE BUS BUFFERS
CONTROL LOGIC
SYSTEM (MPU) CLOCK + DMA CONTROL
MPU
ϕ_1 ϕ_2
D_7
D_0
A_{15}
A_0

MPU RAM REPROM BOARD



EXTENSION ATX BOARD

This board is an extension to the 12K message memory already fitted on the MPU RAM/REPROM board. The total capacity when this board is fitted is 32 K BYTES (232 BLOCS)- a bloc being 128 characters.

The main circuits on this board are :-

- II RAM memories type 5517
- 1 line decoder 74159
- 1 PIA 6821
- 1 EPROM 2764
- 2 octal buffers/line driver with 3 state outputs 74LS S41
- 1 octal bus transceiver 74LS 245.

THE RAM MEMORY CHIP

The RAM memory chip is 5517 type which has a capacity of 2 K BYTES. There is provision to fit 16 memories on the board (Z1-Z16) but only II are presently used. (see board display)

PIA 6821 AND LINE DECODER 74 159

The paging method is used to extend the memory capacity which means that for one MPU address it is possible to work with more than one location. However the MPU must previously indicate through the PIA with which location it wants to work. The PIA (Z17) receives on its register A the page with which the MPU wants to read or write. This information is sent to the input of the line decoder (Z21 which by means of one of its 16 outputs selects the RAM (signals $\overline{SEL1}$ to $\overline{SEL16}$).

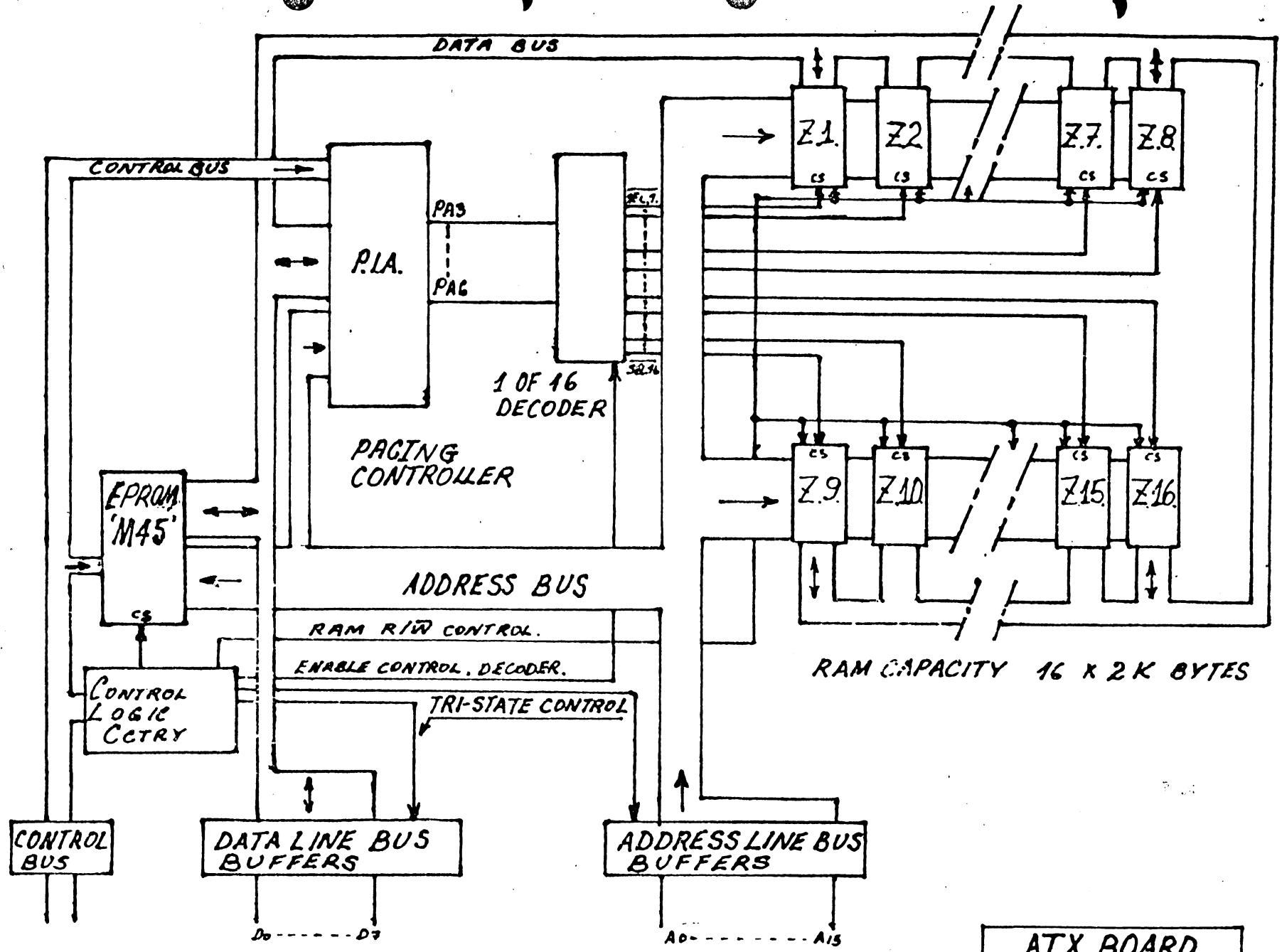
OCTAL BUFFER/LINE DRIVER WITH 3 STATE OUTPUTS 74LS 245 AND 74 LS 541

These three IC (Z12, Z20, Z23) are used to buffer the address bus and data bus of the MPU. The 3 state ability is only used on the data bus lines.

EPROM 2764 (M45

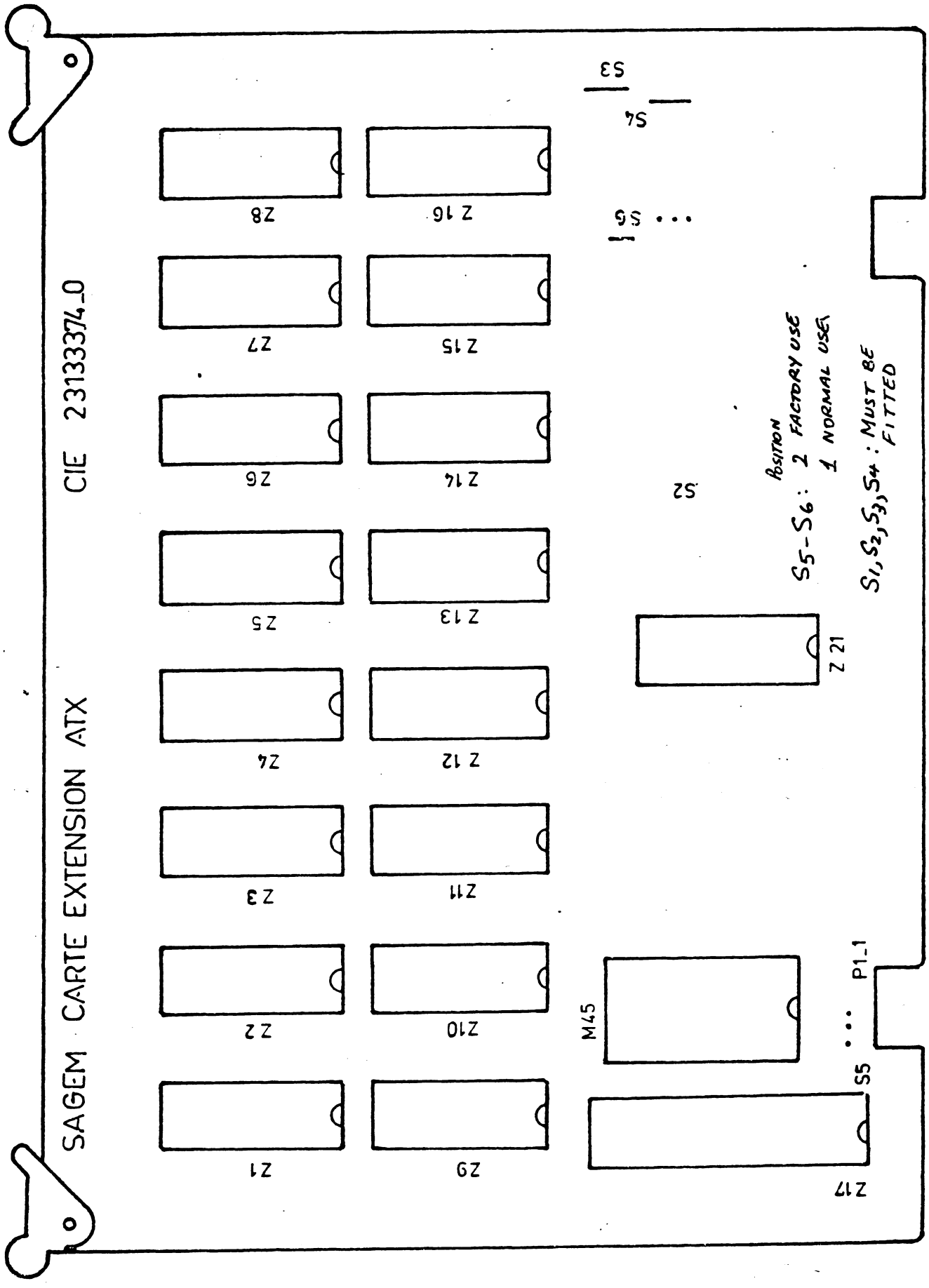
This eprom is part of the line software and contains the retry software.

EPROM (M45) WITH RETRY FACILITY



ATX BOARD MEMORYEXPANSION+ RETRY FACILITY.

EXTENSION ATX BOARD
LINE UNIT



INTERFACE ACIA + ECHANGE BOARD

This board is used by the line unit to interface with the preparation unit and printing unit.

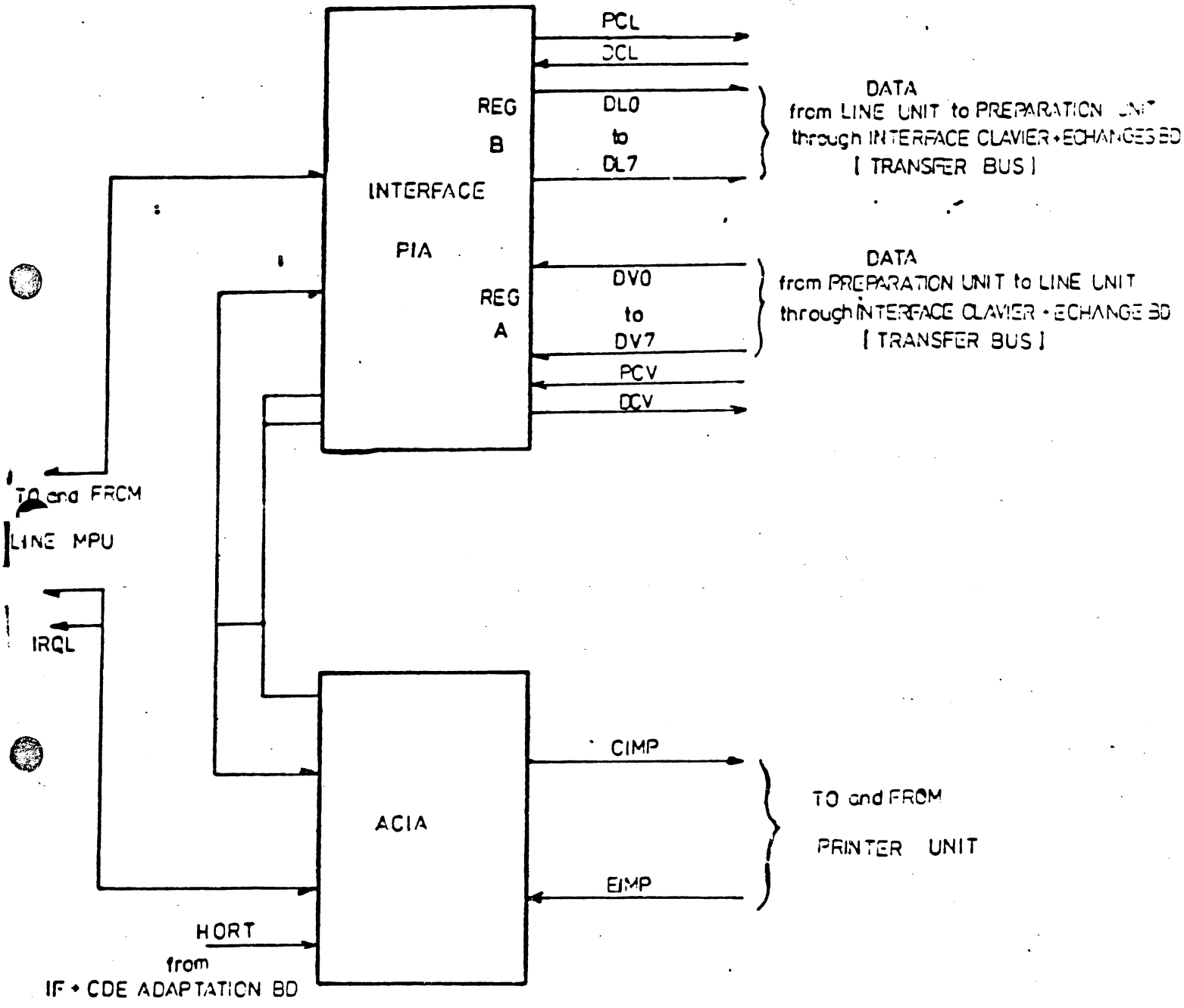
This board is composed of 2 integrated circuits, one PIA (Z1) and one ACIA (Z2)

PIA.Z1

This is used by the line unit to interface with the preparation unit via the transfer bus, through the interface clavier + echange board. Its data is directly connected to the line MPU data bus. Its register A is connected to register B of PIA Z8 of interface clavier + echange board and its register B is connected to register A of PIA Z8 of the same board. Register A receives data from prep unit for line unit. Register B transmits data from line unit to prep unit. This PIA is addressed by the line MPU.

ACIA Z2

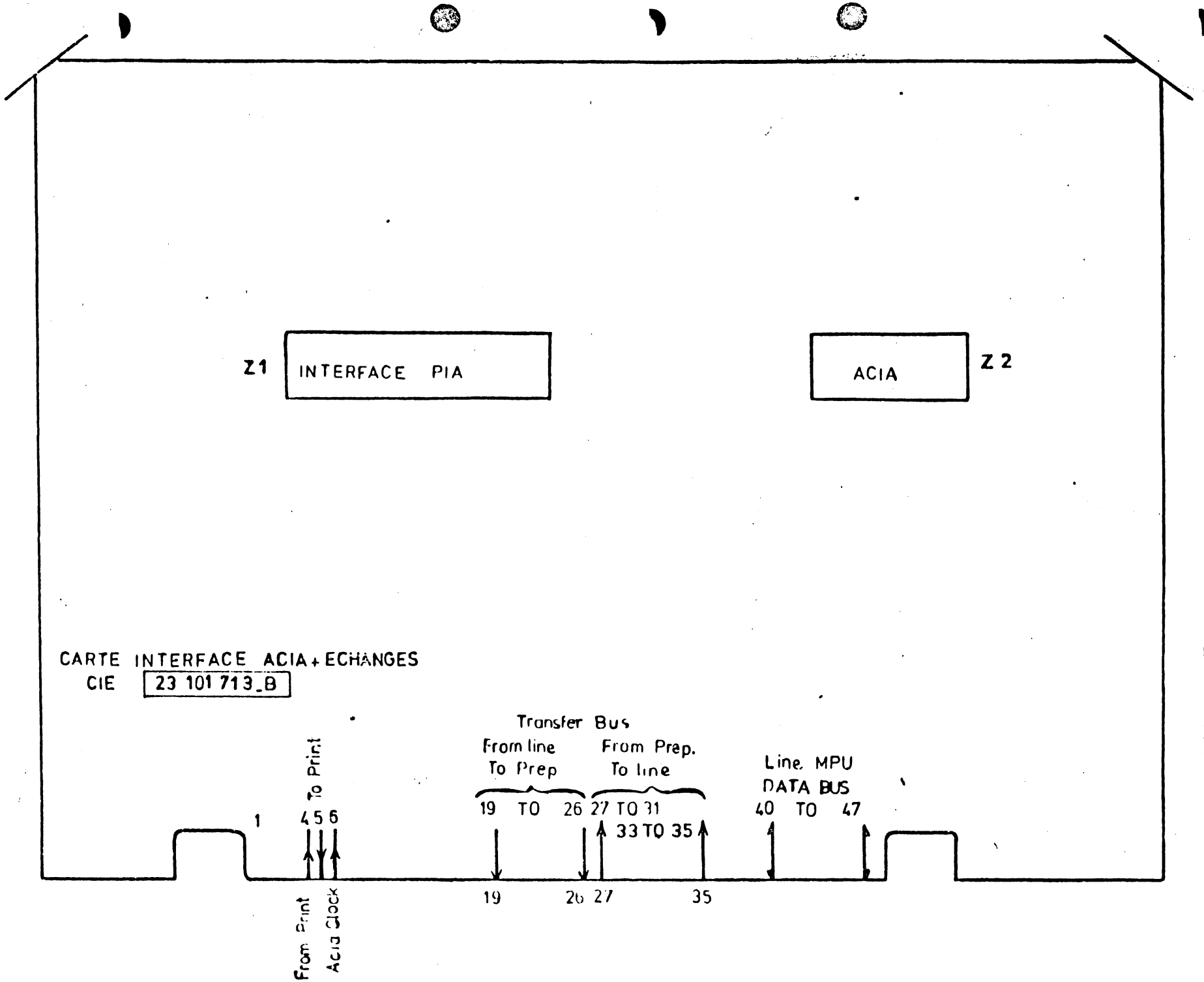
This is used by the line unit and printing unit to exchange data. Data between the 2 modules is in series configuration at a speed of 1200 BD. Clock pulses to run the ACIA are provided by a circuit located on the indicatif + commande adaptation board. Series data from the line unit leaves by pin 5 of the connector and series data from printing unit arrives by pin 4 of the connector. ACIA addressing is controlled by line MPU.



INTERFACE ACIA + ECHANGES

BOARD

INTERFACE ACIA + ECHANGES BCARD
LINE UNIT



TRANSFER BUS

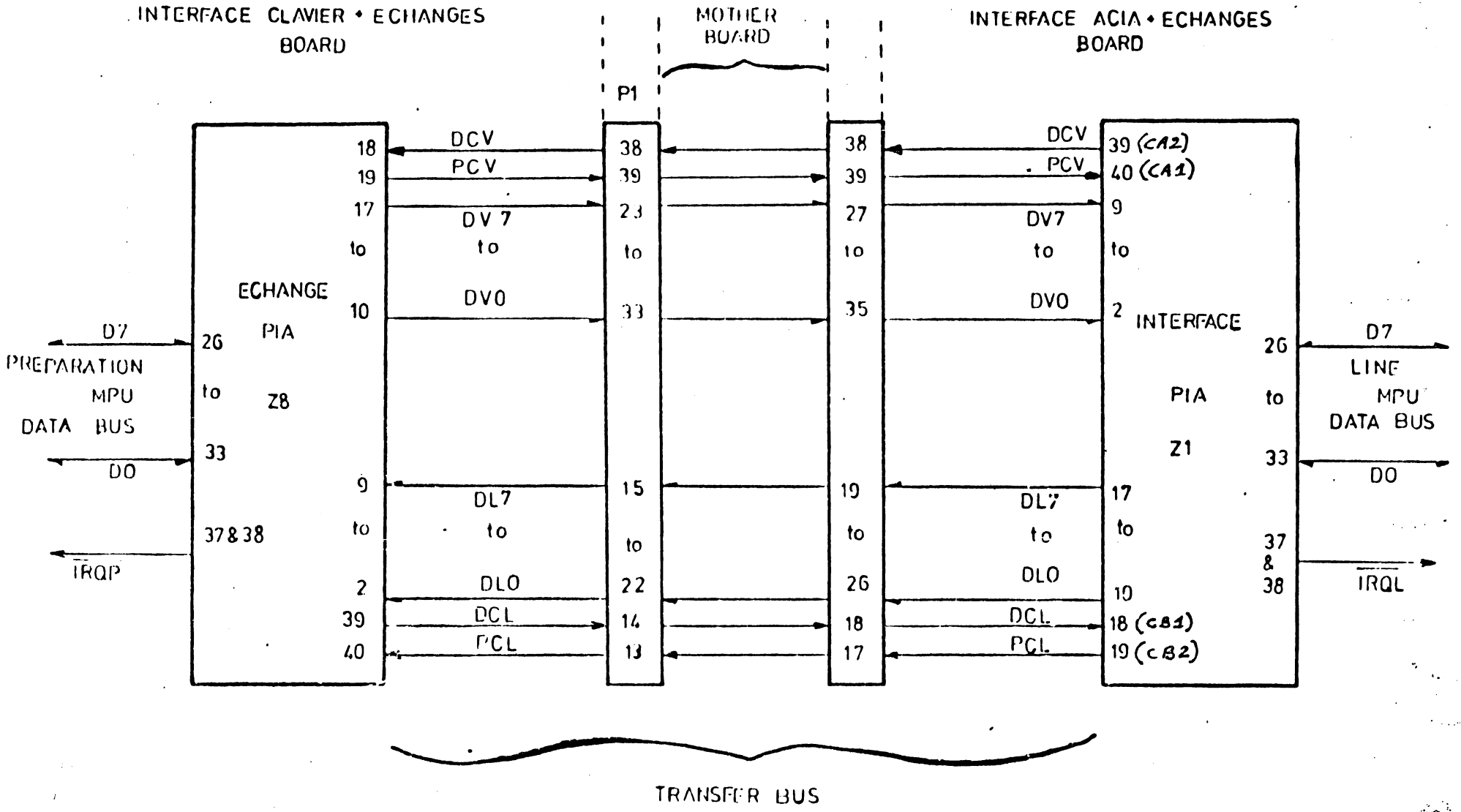
MADE UP OF :

LINE MODULE

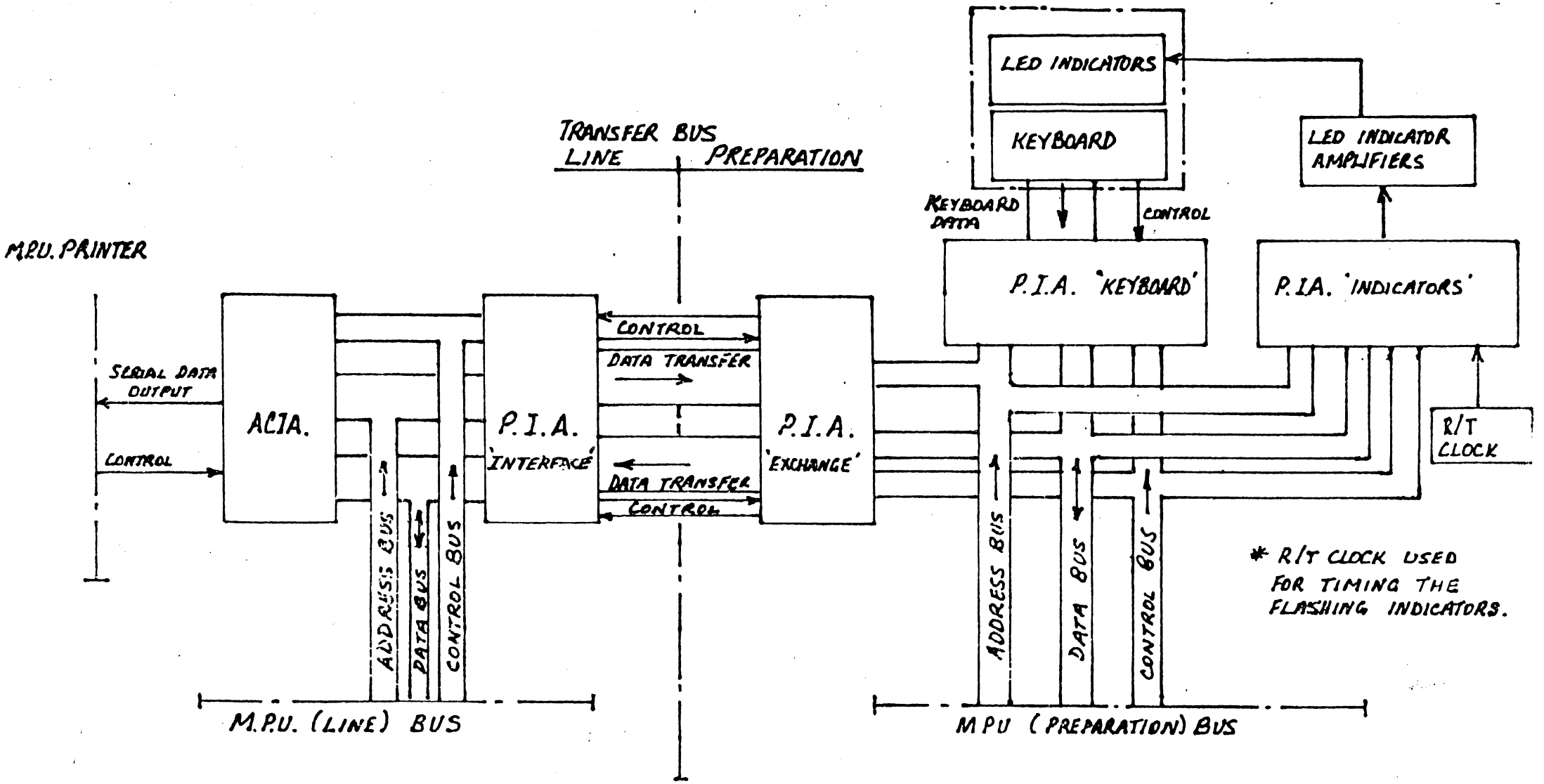
ACIA + INTERFACE BOARD

PREPARATION MODULE

KEYBOARD +EXCHANGE BOARD


INTERFACE CLAVIER • ECHANGES BOARD
MOTHER BOARD
INTERFACE ACIA • ECHANGES BOARD
P1
ECHANGE PIA Z8
INTERFACE PIA Z1
D7 PREPARATION MPU DATA BUS
DO
IRQP
D7 LINE MPU DATA BUS
DO
IRQL
18 DCV 38 38 DCV 39 (CA2)
19 PCV 39 39 PCV 40 (CA1)
17 DV7 to DV0 23 27 DV7 to DV0 9 to 2
10 33 35
26 to 33
9 DL7 to DL0 15 19 DL7 to DL0 17 to 10
37&38
2 22 26
39 DCL 14 18 DCL 18 (CB1)
40 PCL 13 17 PCL 19 (CB2)
37 & 38
TRANSFER BUS

TRANSFER BUS



ACIA + EXCHANGE INTERFACE
KEYBOARD + EXCHANGE INTERFACE

—GM—

PREPARATION MODULE

INTERFACE CLAVIER AND ECHANGES BOARD

This board is used by the preparation MPU to interface with the keyboard module and the line unit.

Functions performed on this board :-

This board is mainly composed of 3 PIA (Z5,Z6 and Z8) and 1 monostable 9602 (29).

PIA Z5

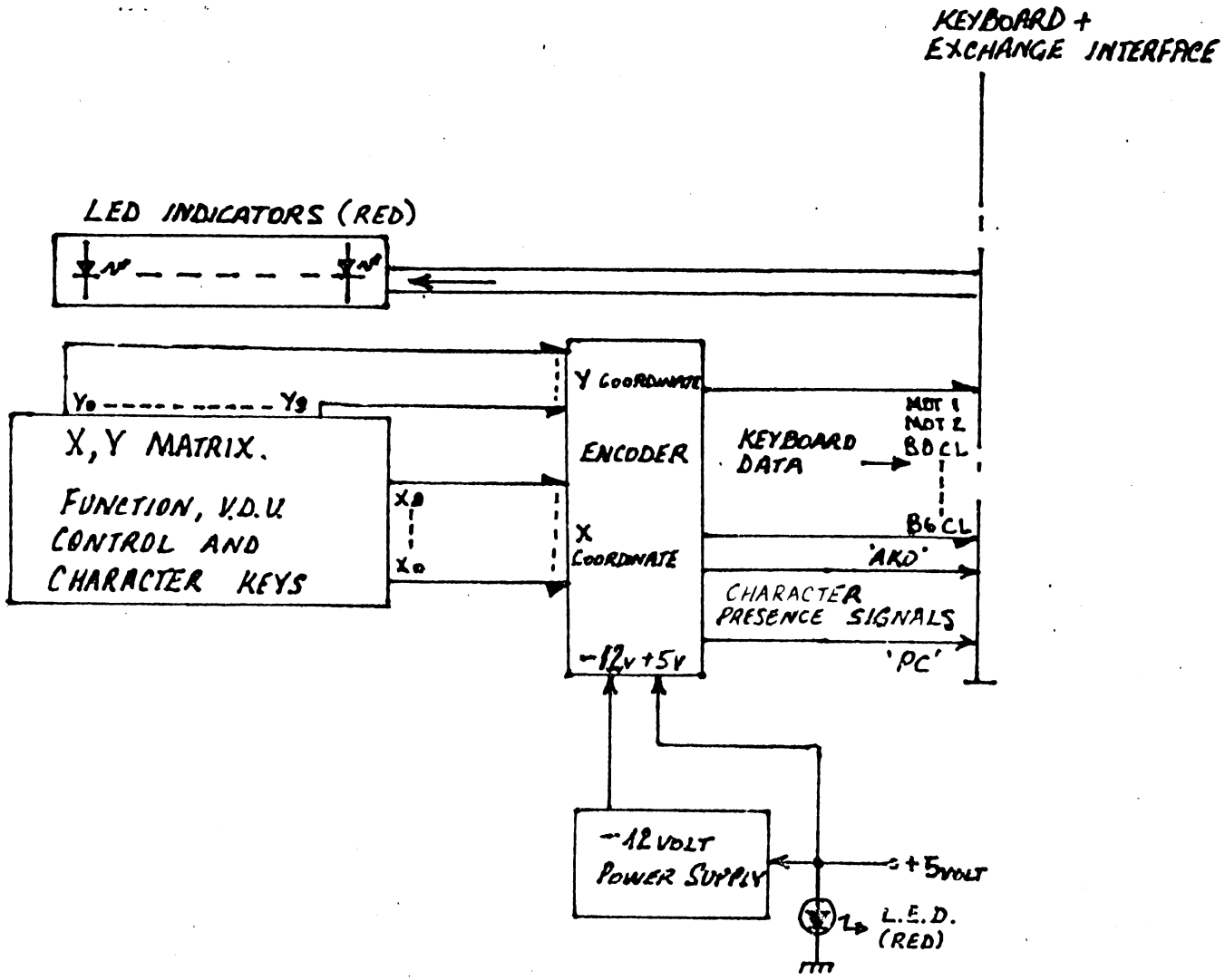
This is used to interface with the keyboard module. Signals to awake the TX35 when in stand-by mode pass through this PIA and inverter Z1. This signal enters the board by connector P3 pin 12 and leaves by connector P1 pin 1. Any key depressed activates this signal.

PIA Z6

This is used to command the led located on the keyboard. Led located on key [ro] excluded. This led being used as a "power-on" indicator. Timer circuit made with monostable Z9 is also connected to this circuit (CA1). This timer is used as a real time clock to flash the led.

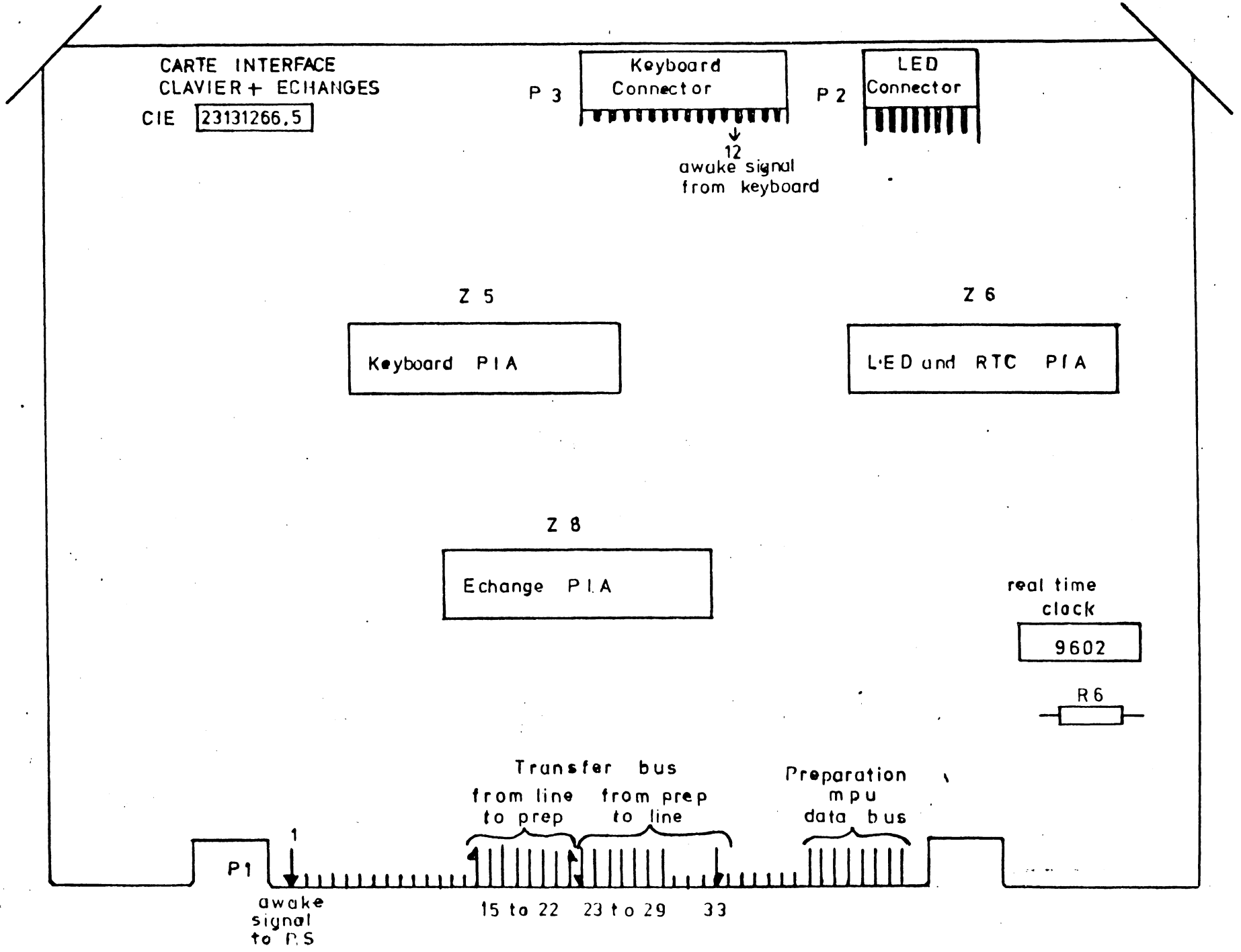
PIA Z8

This is used by the preparation unit to interface with the line unit via the Acia + echange board. Its data bus is connected to the preparation unit MPU data bus. Register B is used to transfer data from preparation module to line module and register A is used to receive data from the line module, both via the PIA Z1 of acia + echange board. Connections between this PIA (Z8) and the PIA (Z1) located on board acia + echange can be regarded as a transfer bus.



KEYBOARD
MODULE

-GM-



INTERFACE CLAVIER + ECHANGES BOARD
PREP UNIT

INTERFACE VISUALISATION BOARD

This board is used to interface between the preparation microprocessor and the display unit and allows the MPU to display 20 lines of a message on the screen, the contents of this message being stored in the RAM located on the MPU board of the preparatuon module.

The mains circuits of this board are :-

- The display time base circuitry
- The CRTC (programmable CRT controller) 8275
- The character generator

THE TIME BASE CIRCUIT

This is composed of a 28.080 MHz crystal controlled oscillator and dividers, to produce the dot frequency, character frequency, the horizontal frequency (line) and vertical frequency (frame).

THE PROGRAMMABLE CRT CONTROLLER

This is a single chip device to interface CRT raster scan display with microprocessor systems. Its primary function is to refresh the display by buffering the information from the main memory and keeping track of the display position of the screen. (See following page for operational description)

THE CHARACTER GENERATOR (2311-350-5)

The character generator contains the pattern of each character to be displayed and according to the address sent to its inputs by the CRTC, delivers data which is dots or no dots for one row of one character . (See fig. 4) This data properly mixed with the synchronisation signal, gives a video signal which is sent to the display unit. This signal is in serial form.

SWITCHES

SW1 : Position 2 is used when the board is tested on equipment in the factory
Must be in position 1 when in machine

SW2 : Position 2 as above
Must be in position 1 when in machine

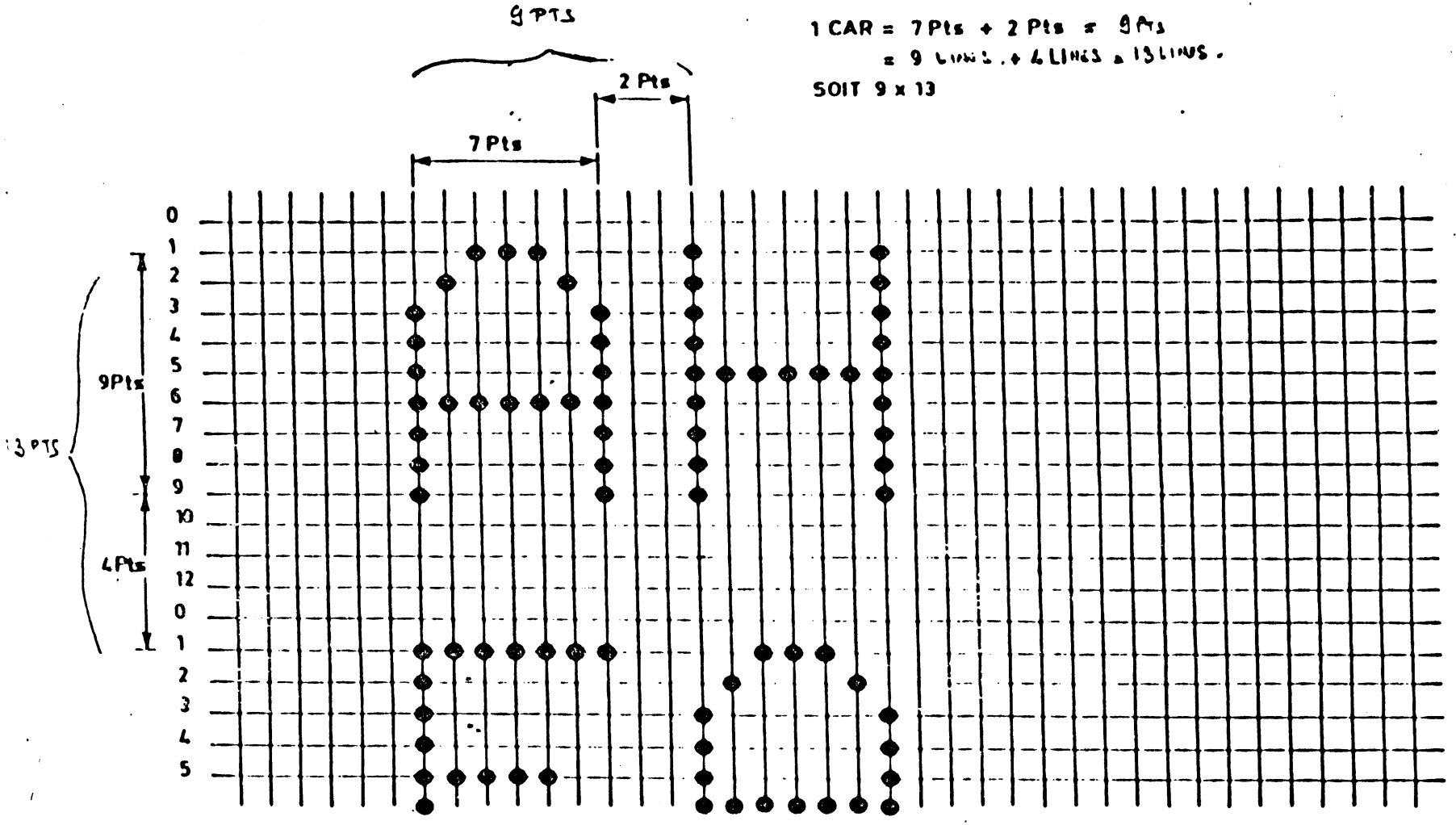
OSCILLATOR FREQUENCY CALCULATION

Number of frames per second	:	50	
Number of rows per frame	:	x 24	
Number of lines per row	:	x 13	
Number of characters per row	:	x 100	*
Number of dots per character	:	x 9	
From sinusoidal to square waves	:	x 2	
TRANSFORMATION			

$28.08 \quad 10^6$

* 100 characters = 69 + hor retrace
72 + hor retrace
80 + hor retrace

1 frame = 1 service line
1 tabulation line
20 message lines
2 time of 1 line for verticla retrace



NOTA: THESE PARAMETERS ARE LOADED INTO THE CRTC WHEN INITIALISATION OF TABS IS PERFORMED.

General Systems Operational Description

The 8275 provides a "window" into the microcomputer system memory.

Display characters are retrieved from memory and displayed on a row by row basis. The 8275 has two row buffers. While one row buffer is being used for display, the other is being filled with the next row of characters to be displayed. The number of display characters per row and the number of character rows per frame are software programmable, providing easy interface to most CRT displays. (See Programming Section.)

The 8275 requests DMA to fill the row buffer that is not being used for display. DMA burst length and spacing is programmable. (See Programming Section.)

The 8275 displays character rows one line at a time.

The number of lines per character row, the underline position, and blanking of top and bottom lines are programmable. (See Programming Section.)

The 8275 provides special Control Codes which can be used to minimize DMA or software overhead. It also provides Visual Attribute Codes to cause special action or symbols on the screen without the use of the character generator (see Visual Attributes Section).

The 8275 also controls raster timing. This is done by generating Horizontal Retrace (HRTC) and Vertical Retrace (VRTC) signals. The timing of these signals is programmable.

The 8275 can generate a cursor. Cursor location and format are programmable. (See Programming Section.)

The 8275 has a light pen input and registers. The light pen input is used to load the registers. Light pen registers can be read on command. (See Programming Section.)

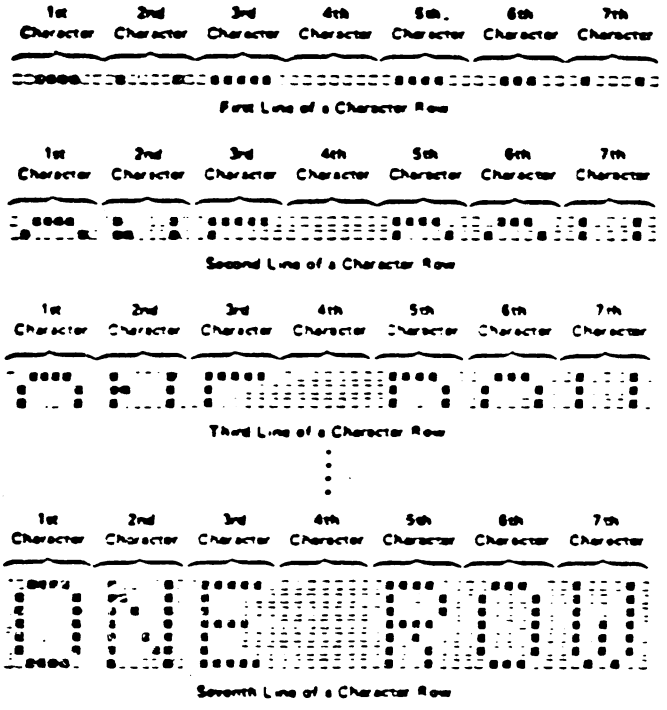
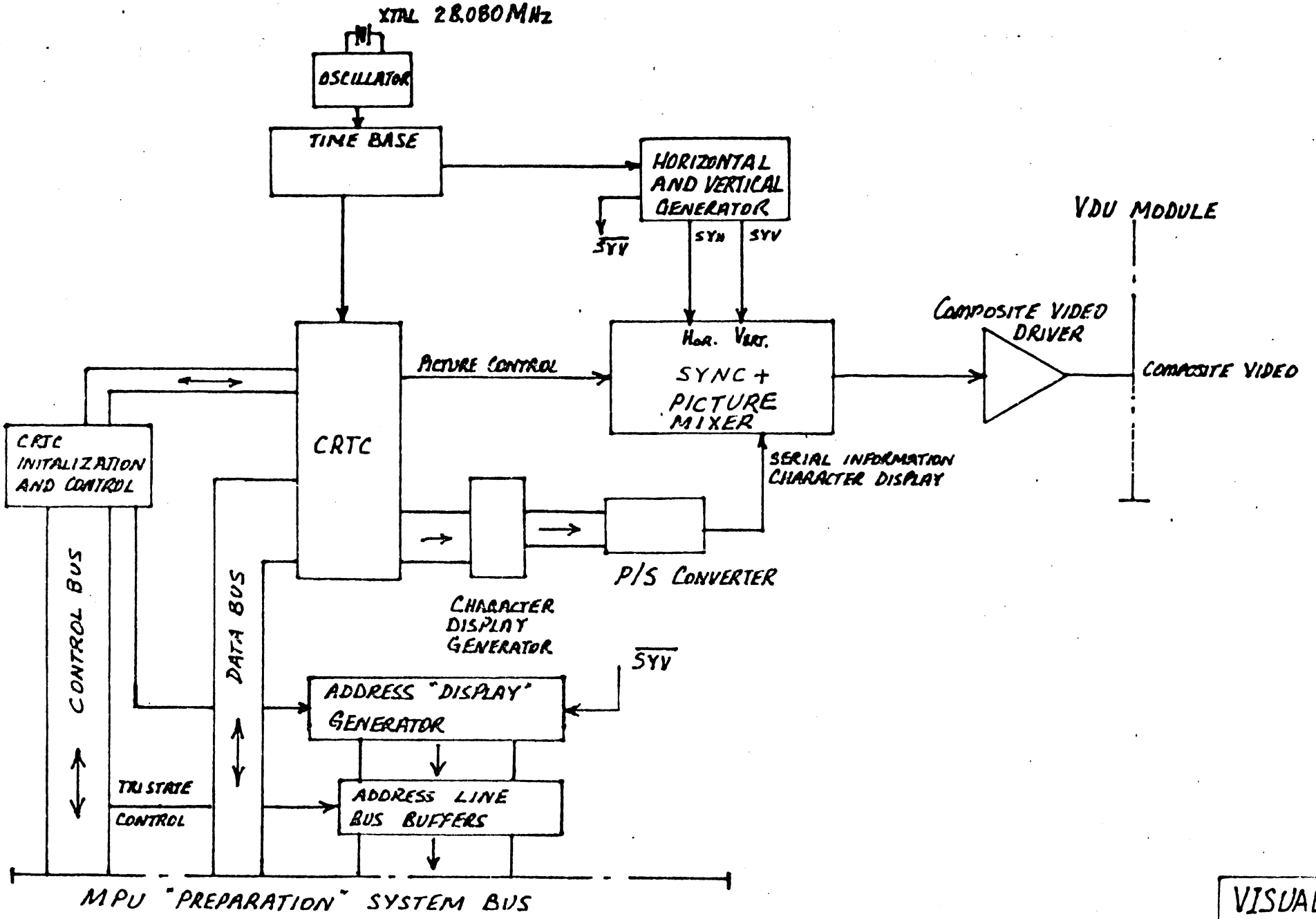


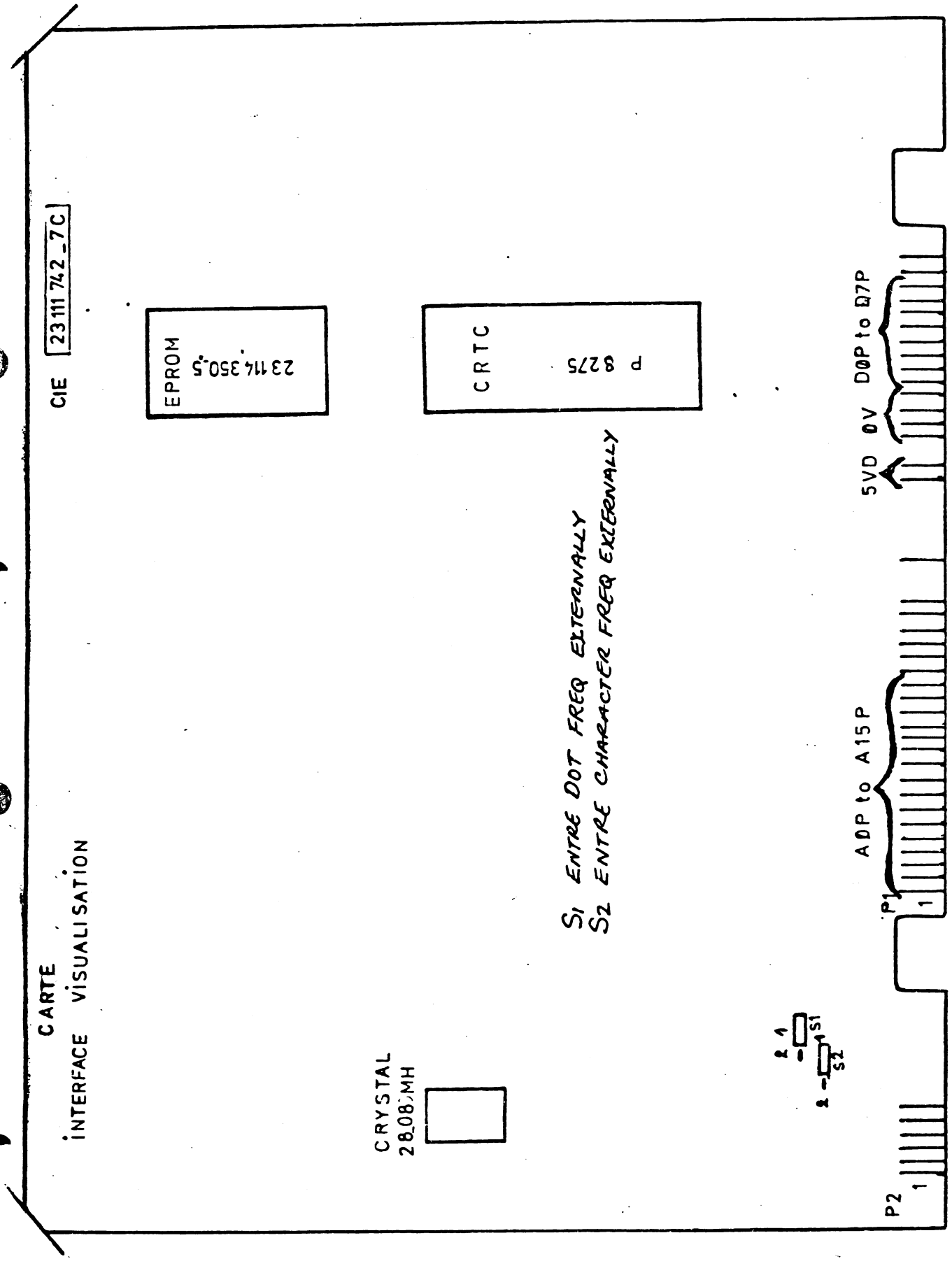
Figure 4. Display of a Character Row

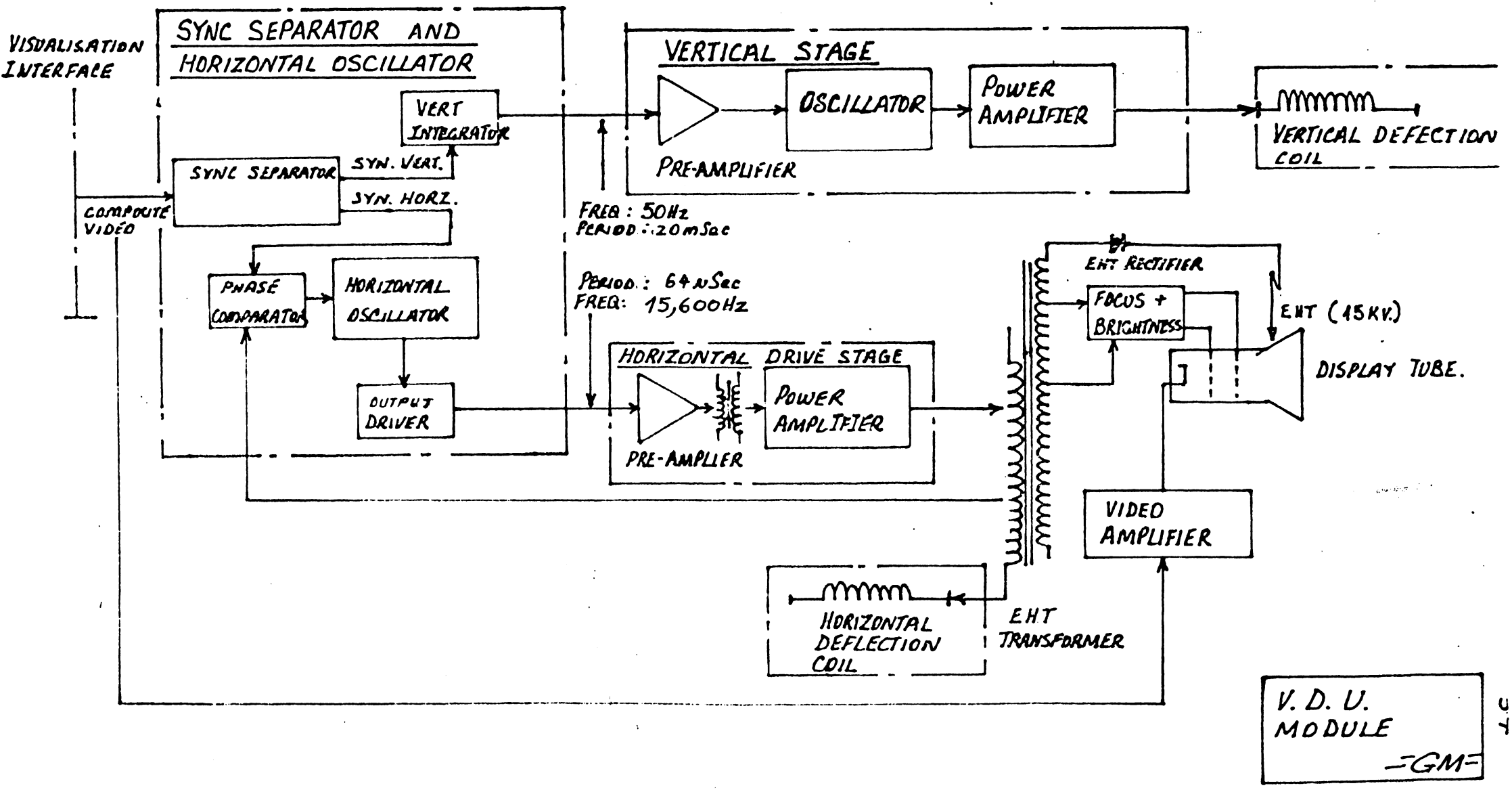


VISUALISATION INTERFACE BOARD

=GM=

INTERFACE VISUALISATION BOARD
PREP UNIT




VISUALISATION INTERFACE
SYNC SEPARATOR AND HORIZONTAL OSCILLATOR
VERT INTEGRATOR
SYNC SEPARATOR
SYN. VERT.
SYN. HORZ.
COMPOUTE VIDEO
PHASE COMPARATOR
HORIZONTAL OSCILLATOR
OUTPUT DRIVER
VERTICAL STAGE
OSCILLATOR
POWER AMPLIFIER
PRE-AMPLIFIER
VERTICAL DEFECTION COIL
FREQ : 50Hz
PERIOD : 20mSec
PERIOD : 64 uSec
FREQ: 15,600Hz
HORIZONTAL DRIVE STAGE
POWER AMPLIFIER
PRE-AMPLIER
EHT RECTIFIER
FOCUS + BRIGHTNESS
EHT (15KV.)
DISPLAY TUBE.
VIDEO AMPLIFIER
HORIZONTAL DEFLECTION COIL
EHT TRANSFORMER
V. D. U. MODULE
-GM-

PRINTER MODULE

MPU IMPRIMANTE BOARD

On this board is fitted the microprocessor which controls the printer unit. It is surrounded by its RAM and REPROM memories, and is connected to the line unit through the ACIA also located on this board.

MICROPROCESSOR

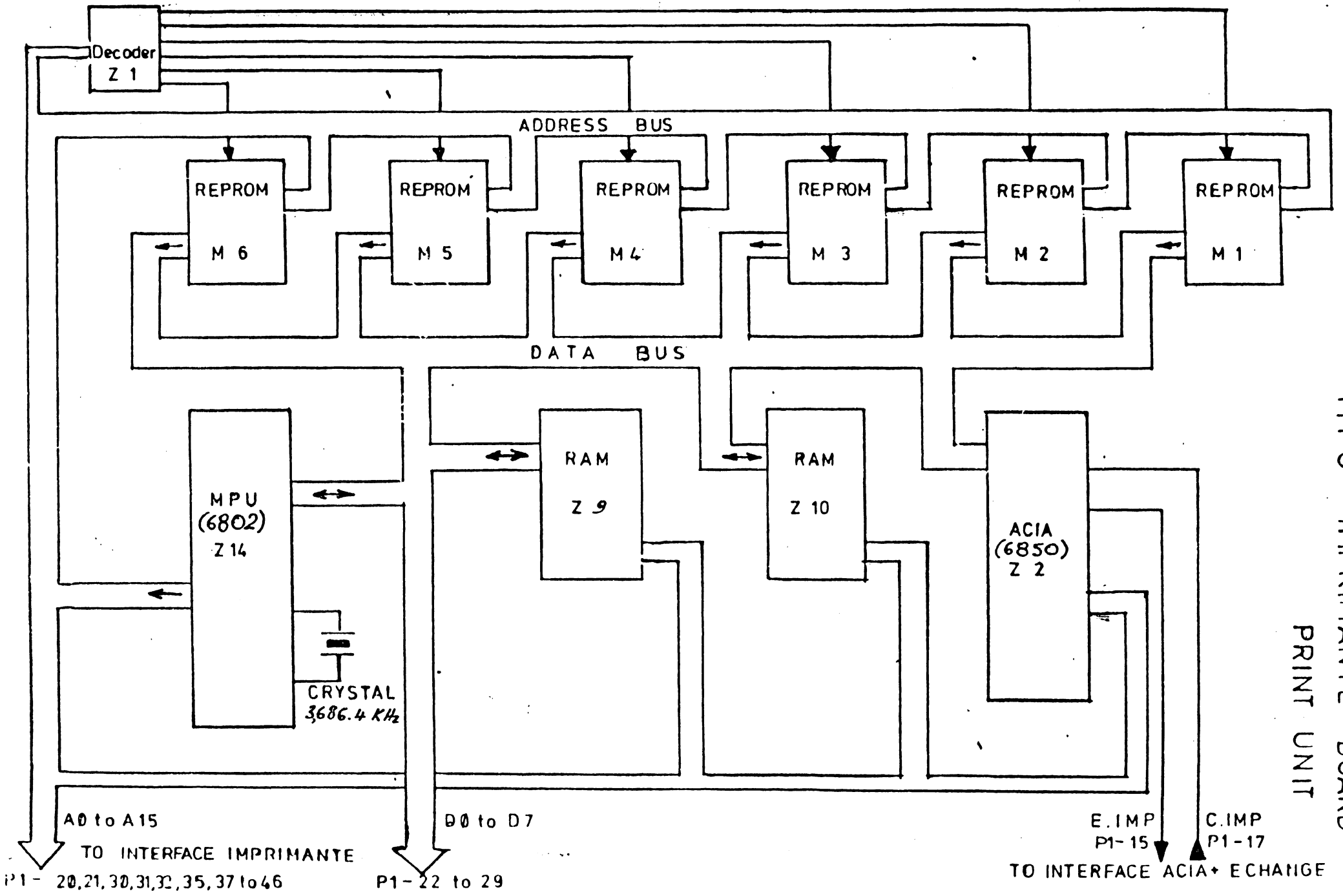
The microprocessor used on this board is a 6802. This type of MPU has its own internal clock. A 3686.4 KHz crystal is used to time it. An output (E) provides a signal which has a frequency of 1/4 crystal frequency, and is in phase with Ø2 of the 6800. This signal is divided by 12 BY A 7492 (Z11) and used as a received and transmit clock for the ACIA.

ACIA

The ACIA (6850) Z2 is used to receive and transmit serial data between the line unit and the printer unit. The transmission speed is 1200BD. Most of the information is from the line unit. The printer unit only sends its status regarding availability to proceed with printing (end of paper - printhead lock etc.)

MEMORIES

Six locations for EPROM 2716 memories are on the board but only three are used. The program is contained in memories M4, M5 and M6.
Two types of 2114 RAM are on this board, they are used as working memories.



MPU IMPRIMANTE BOARD
PRINT UNIT

CARTE INTERFACE IMPRIMANTE

This card is the interface between the printer MPU card and the print mechanics. It consists of three basic sections :-

- Carriage speed and position control
- Printhead pin drive
- Line feed drive

1. CARRIAGE SPEED AND POSITION CONTROL

Carriage speed and position are controlled by the MPU via PIA Z27. The signals CV0 - CV 4 are used to control speed of head travel and CV5 the direction. These signals are sent through a digital to analogue converter Z15. The output from PIN 4 which is amplified by Z16, goes to a gate 1/c type DG201 (Z8). These gates of Z8 are controlled by the $\overline{CAP}$ and $\overline{CAV}$ signals from the MPU via the PIA. The outputs of Z8 are again amplified (Z7), gated (Z26) and amplified (Z3) to give control via RLI of transistors Q12 + Q11. These give the output Vmot (P1-33) which is used to control the motor drive power transistors.

The signals COL.L and SENL (p2 6+3) from the sensor indicate speed and direction of printhead travel. These signals are sent to the MPU via Z6 and Z12. They are also used to generate the EIT signal which via Z13 and Z26 is used to input + or - 15V to Z8.

2. PRINTHEAD PIN DRIVE

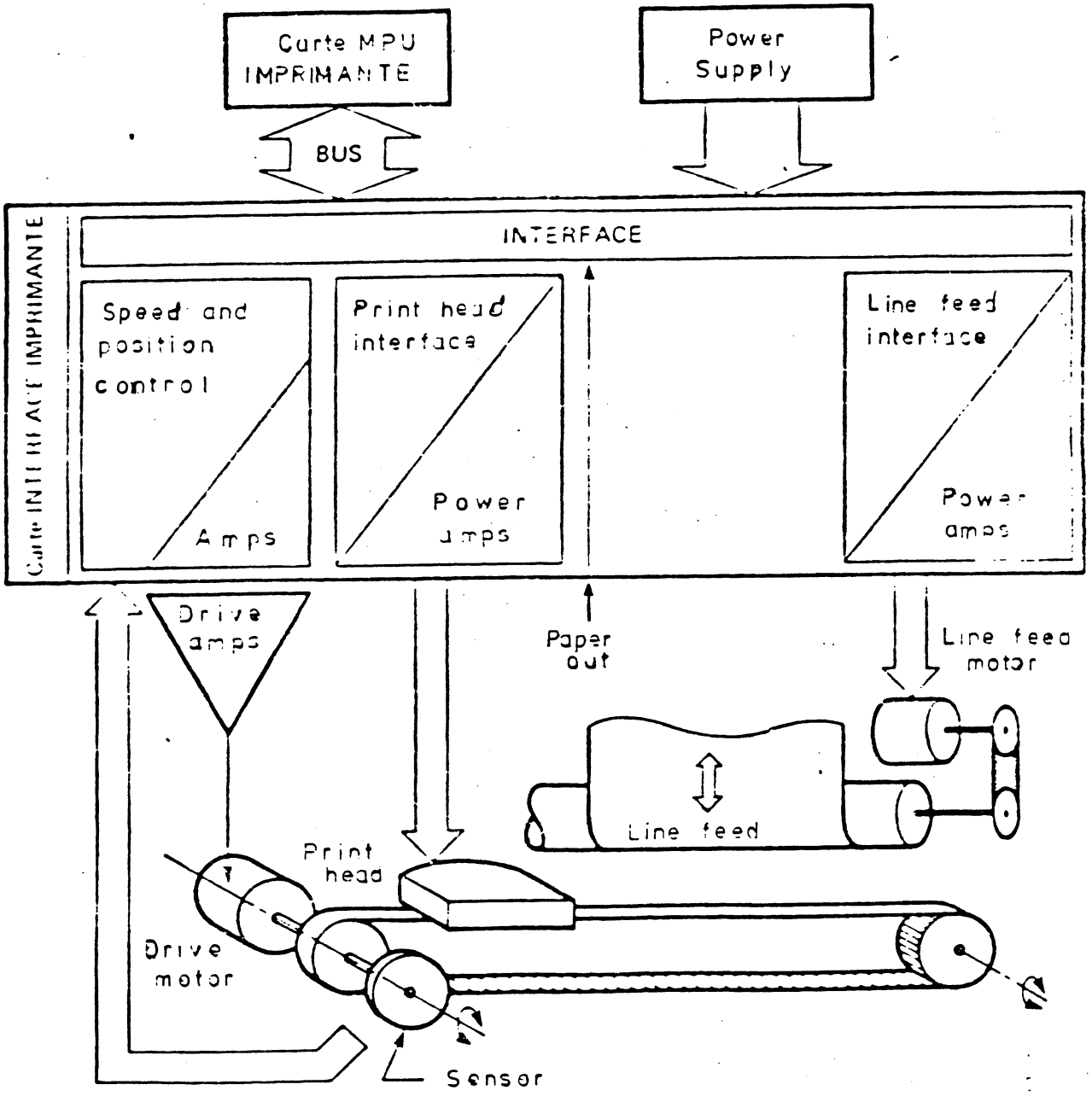
The printhead pins are controlled by the MPU via PIA Z17 PB0-6 and PA6-7. The crystal Y1 and timing chips Z1 give a clock output to Z10 and Z19. The outputs from Z10 + Z19 are gated by Z18 and used to enable the gates Z20, Z21 and one gate in Z28, for a set length period of time. Thus saturating Q1-Q9 for a set period as required to fire pins.

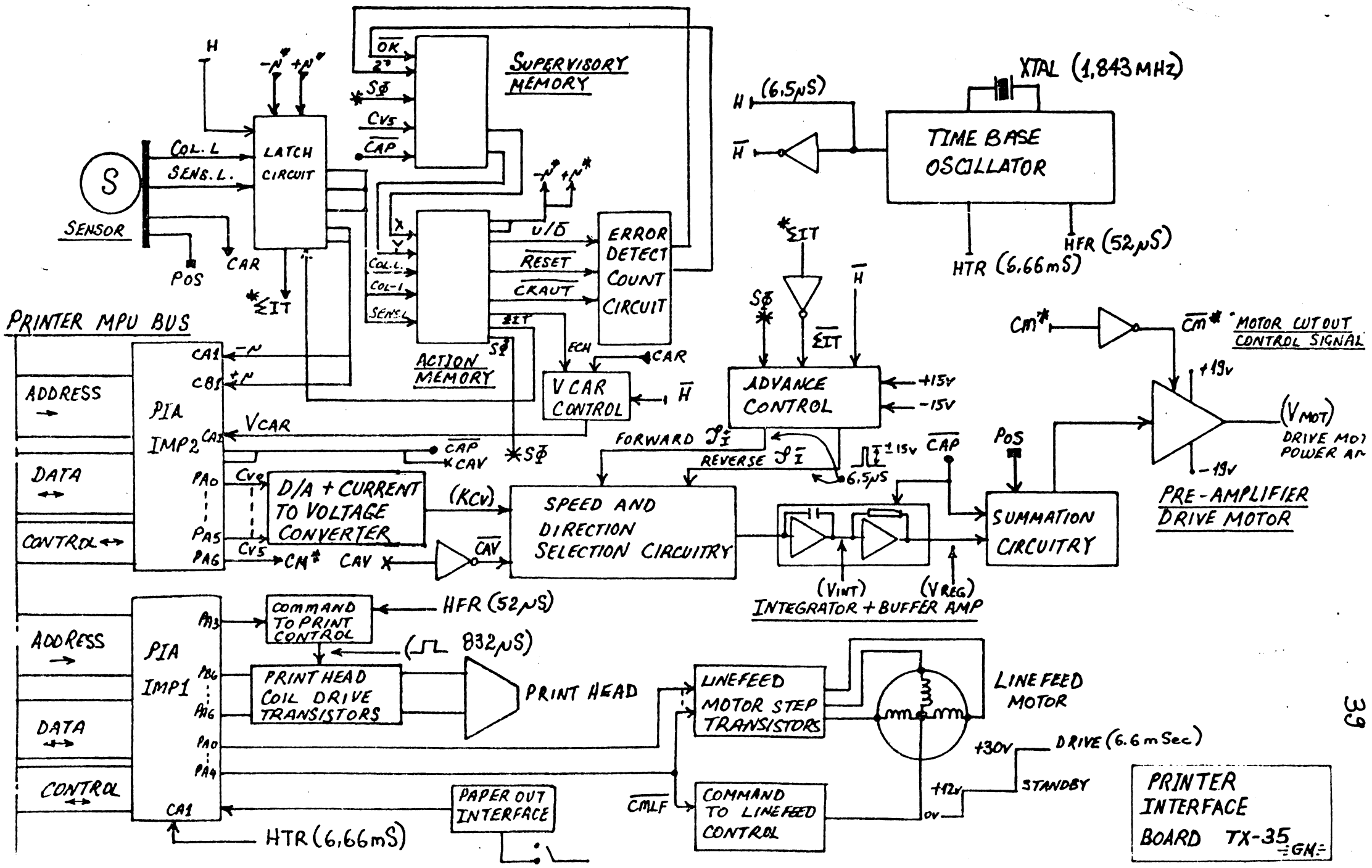
3. THE LINE FEED DRIVE

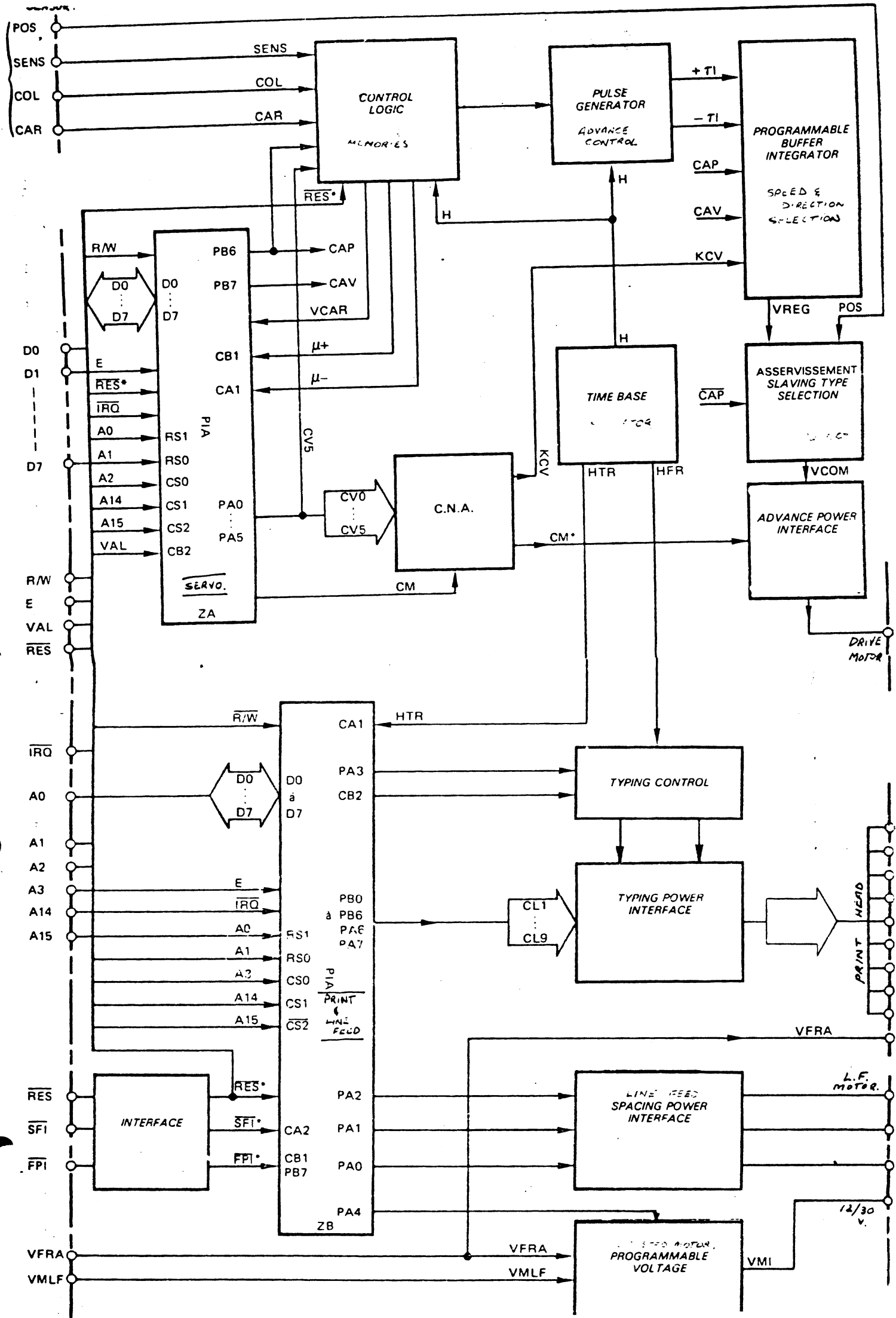
The line feed is controlled via PIA Z17 PA0-Z and PA4. Signals on PA0-Z via Z30 switch on and off Q13, Q14 + Q15 as required to earth the coils of the line feed motor. The signal on PA4 gives control of Q10, via Z30 and Q16, this is used to provide the stepping voltage for the three coils of the line feed motor.

NOTE: The PIA Z17 is also used to transmit the end of paper signal to the MPU. This signal comes from the switch on P3 pin 4 to the PAI CBI + PB7 inputs and then onto the MPU.

- PRINT UNIT -


Carte MPU IMPRIMANTE
Power Supply
BUS
Carte INTERFACE IMPRIMANTE
INTERFACE
Speed and position control
Amps
Print head interface
Power amps
Line feed interface
Power amps
Drive amps
Paper out
Line feed motor
Line feed
Print head
Drive motor
Sensor


SUPERVISORY MEMORY
OK
SΦ
CVS
CAP
H
-N* +N*
LATCH CIRCUIT
COL. L
SENS. L.
S
SENSOR
POS
CAR
ΣIT
ACTION MEMORY
X
Y
COL. L.
COL-1
SENS L
U/D
RESET
CRAUT
ΣIT
SΦ
ECH
CAR
ERROR DETECT COUNT CIRCUIT
V CAR CONTROL
H
XTAL (1,843 MHz)
H (6.5μS)
TIME BASE OSCILLATOR
HFR (52μS)
HTR (6,66mS)
ΣIT
SΦ
H
ADVANCE CONTROL
+15V
-15V
FORWARD
REVERSE
6.5μS
CAP
POS
CM*
MOTOR CUT OUT CONTROL SIGNAL
+19V
-19V
(VMOT)
DRIVE MOT
POWER AM
PRE-AMPLIFIER DRIVE MOTOR
PRINTER MPU BUS
ADDRESS
DATA
CONTROL
PIA IMP2
CA1
CB1
CA2
PA0
PA5
PA6
-N
+N
VCAR
CAP
CAV
SΦ
CVO
CV5
D/A + CURRENT TO VOLTAGE CONVERTER
(KCV)
CAV
CM*
SPEED AND DIRECTION SELECTION CIRCUITRY
SUMMATION CIRCUITRY
(VINT)
(VREG)
INTEGRATOR + BUFFER AMP
ADDRESS
DATA
CONTROL
PIA IMP1
PA3
PB6
PA6
PA0
PA4
CA1
COMMAND TO PRINT CONTROL
HFR (52μS)
(832μS)
PRINT HEAD COIL DRIVE TRANSISTORS
PRINT HEAD
LINEFEED MOTOR STEP TRANSISTORS
LINEFEED MOTOR
+30V
DRIVE (6.6 m Sec)
+12V
STANDBY
0V
CMLF
COMMAND TO LINEFEED CONTROL
PAPER OUT INTERFACE
HTR (6,66mS)
PRINTER INTERFACE BOARD TX-35 GM


POS
SENS
COL
CAR
CONTROL LOGIC
MEMORIES
PULSE GENERATOR
ADVANCE CONTROL
+TI
−TI
PROGRAMMABLE BUFFER INTEGRATOR
SPEED & DIRECTION SELECTION
CAP
CAV
KCV
H
RES*
R/W
D0
D7
PB6
PB7
VCAR
μ+
μ−
CB1
CA1
E
IRQ
A0
A1
A2
A14
A15
VAL
RS1
RS0
CS0
CS1
CS2
CB2
PA0
PA5
PIA
SERVO.
ZA
CV5
CV0
C.N.A.
CM
CM*
TIME BASE
HTR
HFR
ASSERVISSEMENT SLAVING TYPE SELECTION
VCOM
VREG
ADVANCE POWER INTERFACE
DRIVE MOTOR
TYPING CONTROL
TYPING POWER INTERFACE
CL1
CL9
PRINT HEAD
PB0
PB6
PA6
PA7
PRINT
LINE FEED
VFRA
INTERFACE
SFI*
FPI*
CA2
CB1
PB7
PA2
PA1
PA0
PA4
ZB
LINE FEED SPACING POWER INTERFACE
L.F. MOTOR
12/30 V.
STEP MOTOR PROGRAMMABLE VOLTAGE
VMI
VMLF

POWER SUPPLY

POWER SUPPLY

This power supply is a switching P.S. The principle is as follows :-

The mains is rectified and filtered. The DC voltage obtained is sampled at a frequency of around 20KHz. This sampled signal powers the primary of a transformer. The secondary delivers after rectifying and filtering, the voltages to be used in the teleprinter.

Regulation of the output is obtained by means of a loop, which according to the 5V voltage modifies the sampling in order to increase or decrease the voltage.

The power supply is divided into two parts, one is operation full-time (secondary), the other is operating when the teleprinter is not in stand-by mode (primary).

When in stand-by mode only the keyboard, the TG4 board and part of the indicatif + cde adaptation board are supplied with a 5 volts (5vv) P2-4.

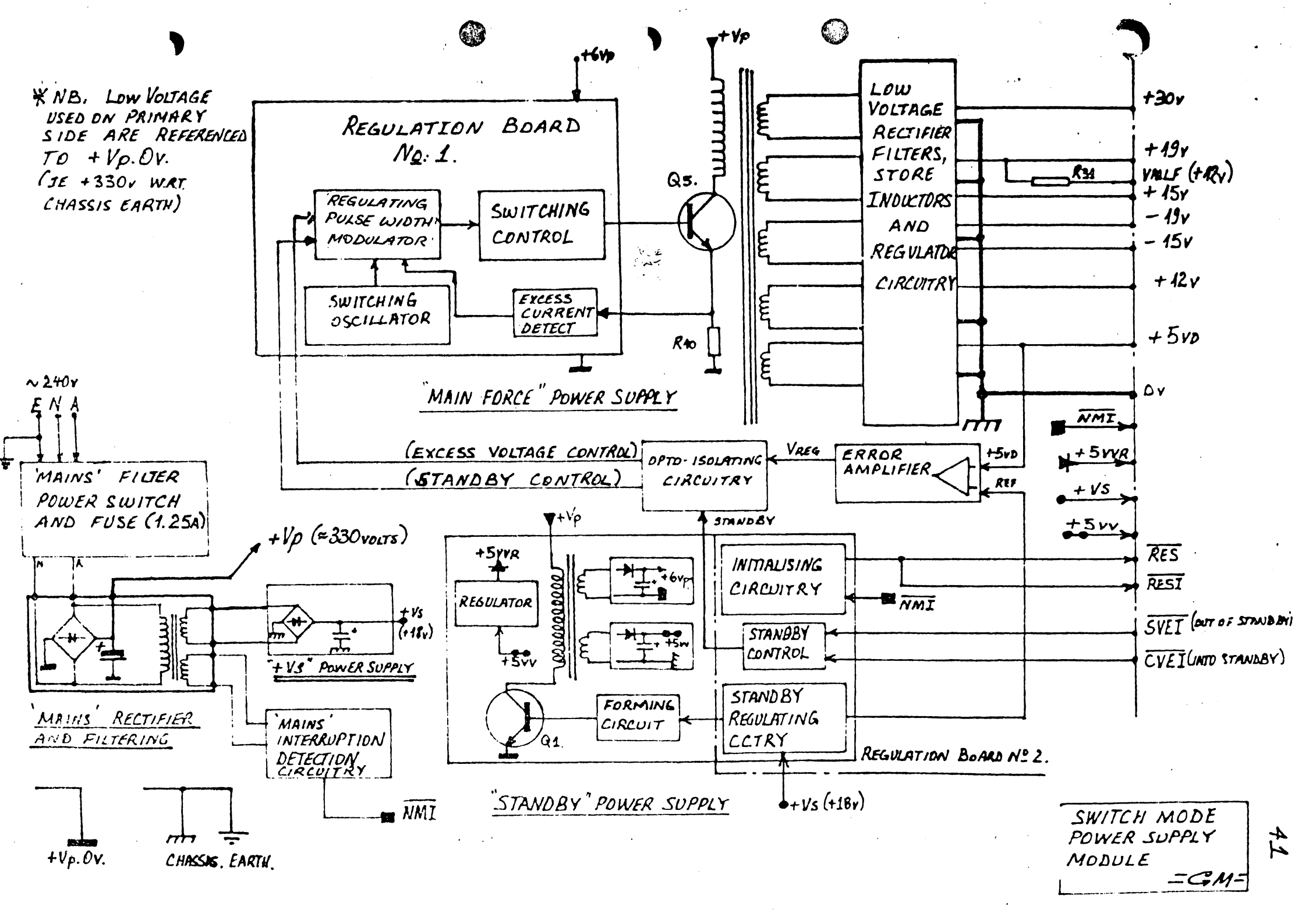
Two other voltages are also permanently present, (+VS) = 19 volts P2-13, which is used to provice the switching curcuit of the primary power supply. and battery charge voltage, +5VS = 5 volts P2 1 and 2, which is used in parallel with the battery and provides the RAM memories. In normal operation, the 5VS line is supplied from the mains. Under mains fail condition the battery provides this line for around 100 hours.

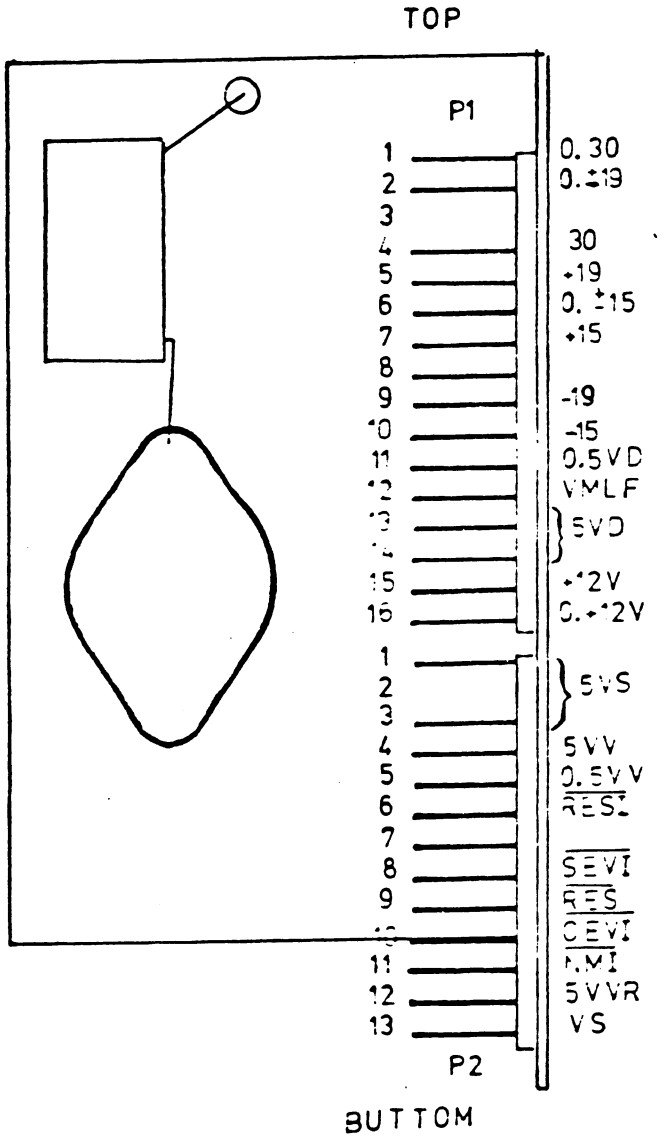
The primary P.S. is under the control of the $\overline{\text{SVEI}}$ and $\overline{\text{CVEI}}$.

The $\overline{\text{CVEI}}$ P2-10 sends the module to stand-by, by switching off the primary P.S. This signal is produced by the line MPU. $\overline{\text{SVEI}}$ P2-8 switches on the primary P.S. for full operation of the machine. This signal is produced by either the keyboard of the TG4 board.

A circuit call"NMI" is also present on this board. Its purpose is to create a signal which it sends to the NMI input on the line MPU every time a failure on the mains is detected.

A restart unit is also fitted to produce two signals, RES p2-9 for line and preparation unit and RESI P2-6 for the printer unit.


* NB. LOW VOLTAGE USED ON PRIMARY SIDE ARE REFERENCED TO +Vp. 0V. (IE +330V WRT CHASSIS EARTH)
REGULATION BOARD No: 1.
+6Vp
+Vp
REGULATING PULSE WIDTH MODULATOR
SWITCHING CONTROL
SWITCHING OSCILLATOR
EXCESS CURRENT DETECT
Q3.
R40
LOW VOLTAGE RECTIFIER FILTERS, STORE INDUCTORS AND REGULATOR CIRCUITRY
R34
+30V
+19V
VALF (+12V)
+15V
-19V
-15V
+12V
+5VD
0V
"MAIN FORCE" POWER SUPPLY
~240V
E N A
'MAINS' FILTER POWER SWITCH AND FUSE (1.25A)
(EXCESS VOLTAGE CONTROL)
(STANDBY CONTROL)
OPTO-ISOLATING CIRCUITRY
VREG
ERROR AMPLIFIER
+5VD
REF
NMI
+5VVR
+VS
+5VV
+Vp (≈330VOLTS)
+VS (+18V)
"+VS" POWER SUPPLY
'MAINS' RECTIFIER AND FILTERING
'MAINS' INTERRUPTION DETECTION CIRCUITRY
NMI
+Vp
+5VVR
REGULATOR
+5VV
+6Vp
+5VV
STANDBY
INITIALISING CIRCUITRY
NMI
STANDBY CONTROL
FORMING CIRCUIT
Q1.
STANDBY REGULATING CCTRY
REGULATION BOARD No 2.
RES
RESI
SVEI (OUT OF STANDBY)
CVEI (INTO STANDBY)
"STANDBY" POWER SUPPLY
+Vs (+18V)
+Vp. 0V.
CHASSIS. EARTH.
SWITCH MODE POWER SUPPLY MODULE
=GM=
41



P1 = 16 PTS

P2 = 13 PTS

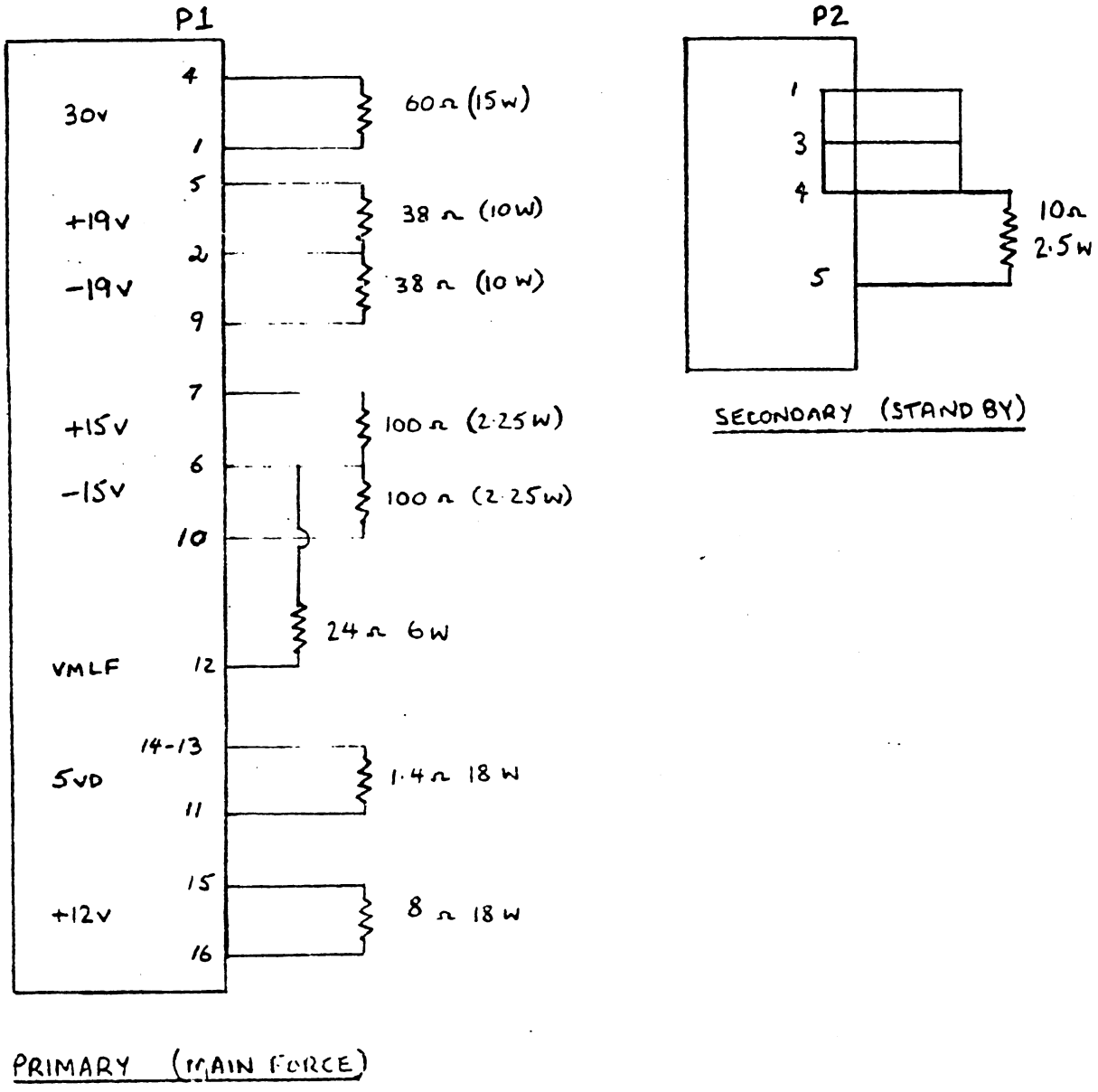
POWER SUPPLY

OUTPUTS

	CONNECTOR PT	DESIGNATION	VALUE MIN	VALUE MAX	
STANDBY SUPPLY P1	1	0 _ 30 V			
	2	0 ± 19 V			
	3				
	4	+ 30 V	29V	36V	
	5	+ 19V	18,5V	23,5V	
	6	0 ± 15			
	7	+ 15 V	14,3V	15,7V	
	8				
	9	- 19V	-18,5V	-23,5V	
	10	- 15V	-14,3V	-15,7V	
	11	0 - 5V			
	12	VMLF	10V	13V	
	13	+ 5 VD	4,75V	5,25V	
	14				
	15	+ 12V	11,4V	12,6V	
	16	0 _ 12V			
MAIN SUPPLY P2	1	+ 5 VS	4,5V	5,5V	
	2				
	3	+ 5 VS	4,5V	5,5V	
	4	+ 5 VV	4,75V	5,25V	
	5	0 - 5 VV			
	6	$\overline{\text{RESI}}$			
	7	NOT USED			
	8	$\overline{\text{SVEI}}$			
	9	$\overline{\text{RES}}$			
	10	$\overline{\text{CVEI}}$			
	11	$\overline{\text{NMI}}$			
	12	5 VVR			
	13	VS	16,5V	21V	

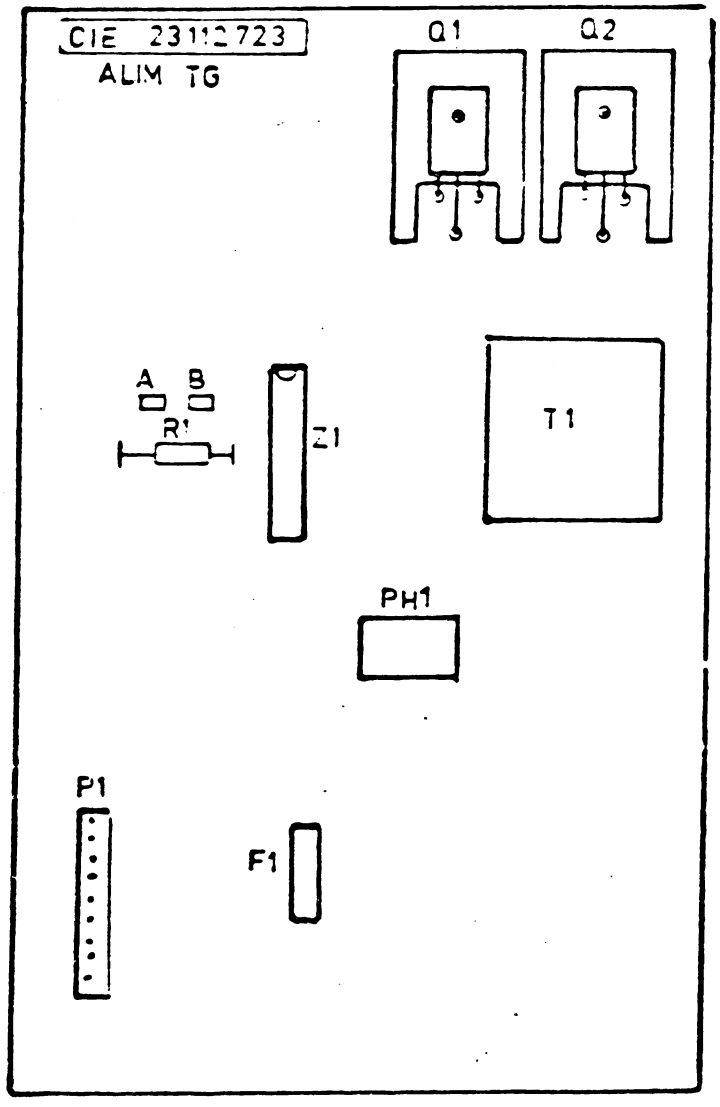
POWER SUPPLY VALUES

RESISTOR LOADS REQUIRED FOR BENCH TESTING POWER SUPPLY

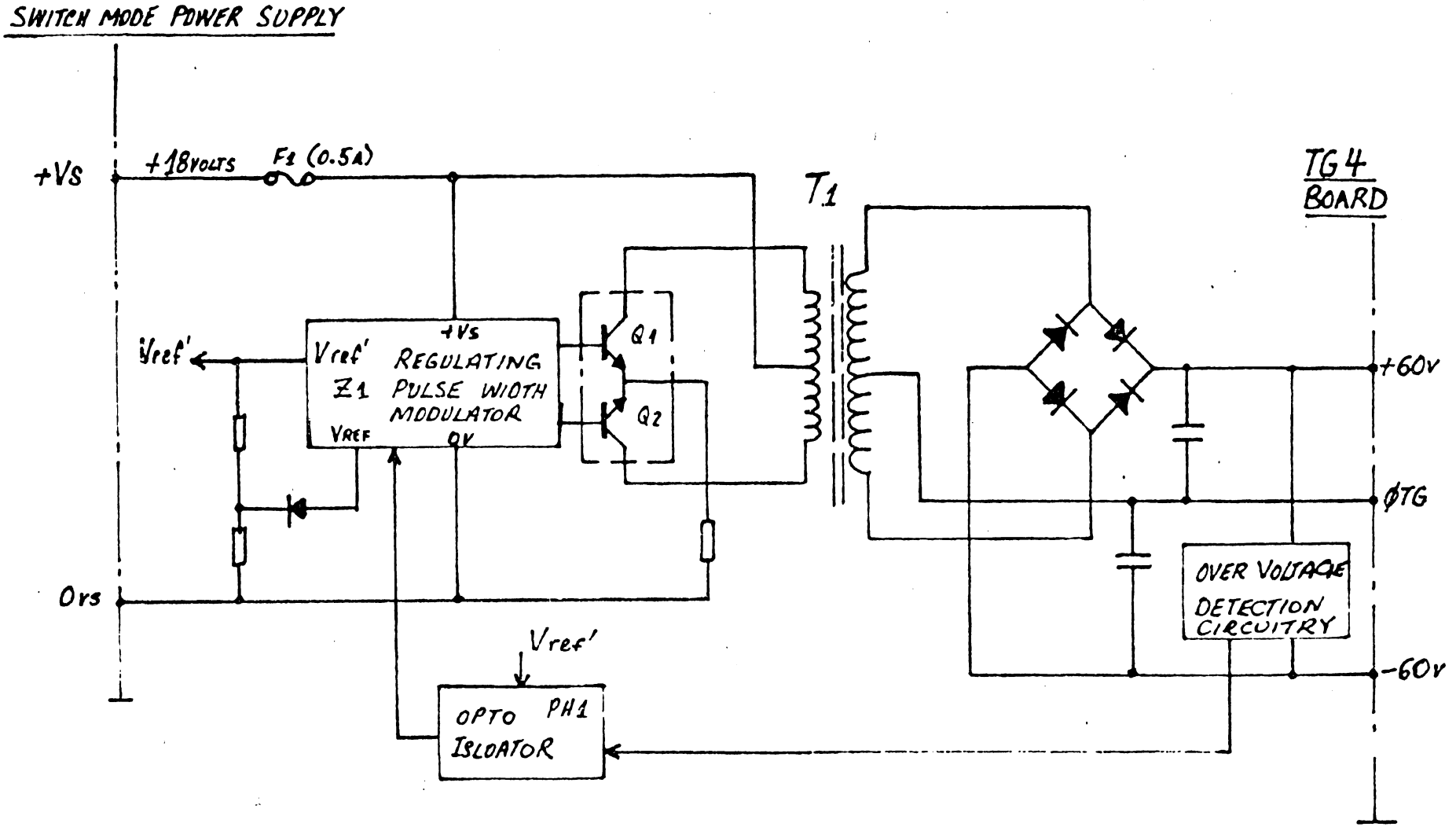


TELEGRAPHIC POWER SUPPLY

This power supply is a switching P.S. based on the same principle as the mains P.S. The D.C. Voltage is provides by the VS voltage and the loop consists of a optical relay (CNY62) which switches on and off the sampling of VS to maintain proper value of the + and - TG voltages.



ALIMENTATION TELEGRAPHIQUE 60V.


SWITCH MODE POWER SUPPLY
+Vs
+18VOLTS
F1 (0.5A)
T1
TG4 BOARD
Vref'
+Vs
Vref'
REGULATING
Z1 PULSE WIDTH
MODULATOR
VREF
0V
Q1
Q2
+60V
ØTG
0vs
OVER VOLTAGE
DETECTION
CIRCUITRY
Vref'
OPTO PH1
ISLOATOR
-60V
TELEGRAPHIC
POWER SUPPLY
± 60VOLTS
-GM-

APPENDIX.1.

STANDBY MODE

This mode is used to decrease power consumption of the teleprinter when idle for a long period of time. It also increases life duration of the visualisation module.

When the TX35 is in stand-by mode only the following are powered :-

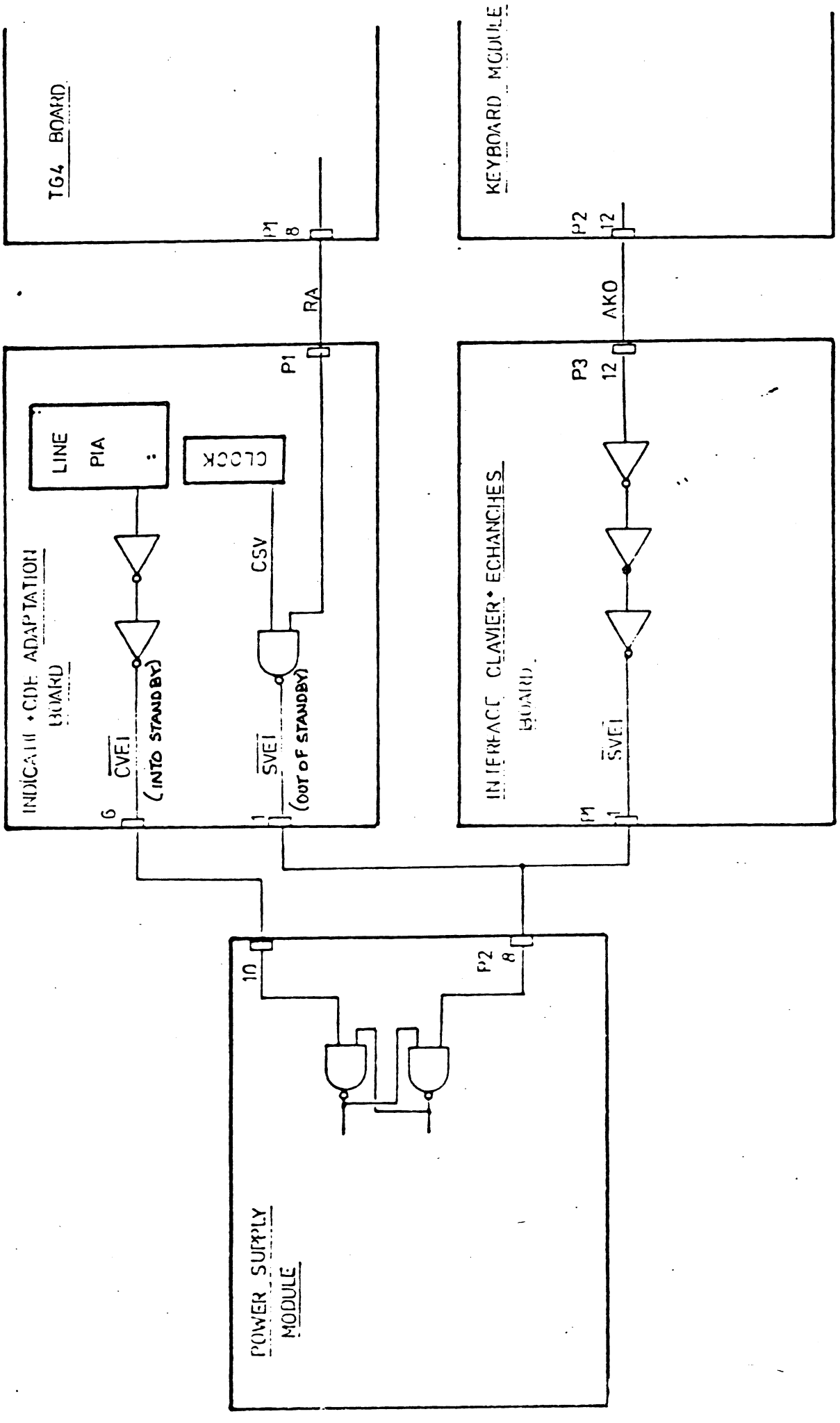
- RAM memories
- clock
- input and outputs from and to keyboard line.

To shift to the stand-by mode the TX35 must be on idle mode for 7 minutes and no message must have to be sent within the following 15 minutes.

There are three actions which awake the TX35 when in stand-by mode :-

- depressing any key of the keyboard module. It must be noted that this key has to be depressed a second time for its codification to be active.
- receiving a message
- being triggered by the clock

The Tx35 is not able to take into account any character received within 450 milliseconds following the change of status of the receive line.



STAND-BY CONTROL CIRCUIT

AUTO-TEST FACILITY

PRINCIPLE

The auto-test is triggered each time the push button located at the back of the TX35 is depressed. (RAZ button). The test is carried out in three phases.

- 1st phase - each unit tests itself according to the autotest contained in its software.
- 2nd phase - each unit attempts to converse with the two others
- 3rd phase - the test results are displayed and printed as well as the menu.
- 4th phase - diagnostic and various initialisations

PHASE 1

Printer Unit • Printhead moves to left hand side

Preparation unit

- All the leds switch on for one second
- Codification is displayed for one second
- REPROM contents is checked by steps of 2K
- RAM are checked without destroying the contents and size of memory is determined
- PIA'S are tested by writing and reading onto the registers

At the end of these tests :

- if the preparation unit is working
  - all the leds of the operation switches remain off
  - end of VDU testing is displayed

- if the preparation unit is not working
  - two leds of one row of the operation switches light up. and the screen displays a number

Interpretation of the result is as follows on the next page.

INTERPRETATION OF RESULT

PREP UNIT

ROW SWITCH ON	FAULT	SCREEN DISPLAY	TOOLING DISPLAY
	MPU NOT RUNNING		07.31
1 o o	RAM	01 * *	01.**
2 o o	REPROM	02 + +	02.++
3 o o	INTERFACE VISUALISATION BD.	03.00	03.00
4 o o	INTERFACE CLAVIER + ECHANGE BD		
	. PIA ECHANGE	04.00	04.00
	. PIA CLAVIER (KEYBOARD)	04.01	04.01
	. PIA VOYANTS (LED)	04.02	04.02
5]	NOT USED		
6]			

For * * and + + see RAM and REPROM allocation

Line unit

- Buzzer sounds once (.5 sec)
- Sending is set to idle
- Relays are closed for a short time
- REPROM contents is checked by steps of 2 K
- RAM is checked by steps of 1 K without destroying the contents, and size of the memory is determined
- PIA's are tested by writing and reading onto the registers.

At the end of these tests :

- if the line unit is working
  - nothing happens and phase 2 is started

Meaning of ** and ++

(**) RAM failure
Step = 1K/1K
Start = 0000

DISPLAYED	START AD	END AD
00	$0000	$03FF
01	$0400	$07FF
02	$0800	$0BFF
03	$0C00	$0FFF
04	$1000	$13FF
05	$1400	$17FF
06	$1800	$18FF
07	$1C00	$1FFF
08	$2000	$23FF
09	$2400	$27FF
10	$2800	$2BFF
11	$2C00	$2FFF
12	$3000	$33FF
13	$3400	$37FF
14	$3800	$3BFF
15	$3C00	$3FFF
16	$4000	$43FF
17	$4400	$47FF
18	$4800	$4BFF
19	$4C00	$4FFF
20	$5000	$53FF
21	$5400	$5700
22	$5800	$5B00
23	$5C00	$5FFF
24	$6000	$63FF
25	$6400	$67FF
26	$6800	$6BFF
27	$6C00	$6FFF
28	$7000	$73FF
29	$7400	$77FF
30	$7800	$7BFF
31	$7C00	$7FFF

(++) REPROM failure
Step = 2K/2K
Start = F800

DISPLAYED	START AD	END AD
00	$F800	$FFFF
01	$F000	$F7FF
02	$E800	$EFFF
03	$E000	$E7FF
04	$D800	$DFFF
05	$D000	$D7FF
06	$C800	$CFFF
07	$C000	$C7FF
08	$B800	$BFFF
09	$B000	$B7FF
10	$A800	$AFFF
11	$A000	$A7FF
12	$9800	$9FFF
13	$9000	$97FF
14	$8800	$8FFF
------ ZONE CIRCUIT E/S ----------		
16	$7800	$7FFF
17	$7000	$77FF
18	$6800	$6FFF
19	$6000	$67FF
20	$5800	$5FFF
21	$5000	$57FF
22	$4800	$4FFF
23	$4000	$47FF

- if the line unit is not working
  - sonor alarm sounds in trains of pulses

INTERPRETATION OF RESULTS

LINE UNIT

FAULTY BOARD	NUMBER OF BURST (PULSES)	TOOLING DISPLAY
MPU NOT RUNNING		07.31
RAM FAULTY	1	01.**
REPROM FAULTY	2	02.++
INDICATIF + CDE ADAPTATION BD	3	
- USART OR TG4 BD		03.00
- PIA IF		03.01
- PIA LIGNE		03.02
- CLOCK PIA		03.03
ACIA + ECHANGES BOARD	4	
- PIA ECHANGE		04.00
- ACIA IMPRIMANTE		04.01
COUPLEUR DISQUE (OPTION)	5	
- PIA		05.00
- FDC		05.01
- DMA		05.02

PHASE II

Dialogue between line unit and preparation unit

Each unit transmits its status to the other. If the dialogue is possible and the exchange of words correct then Phase III is started. If the dialogue is not possible or words not correct the external information is as follows :-

SCREEN FLASH	LINE UNIT FAULTY
AUDIBLE ALARM SOUNDS INTERMITTENTLY	PREPARATION UNIT FAULTY
SCREEN FLASH AND AUDIBLE ALARM SOUNDS INTERMITTENTLY	ELECTRICAL CONNECTION BETWEEN BOTH UNITS
AUDIBLE ALARM SOUNDS PERMANTLY	PRINT UNIT LOCKED

PHASE III

The line unit sends to preparation unit and printer unit

The following information to be displayed and printed :-

Displayed

```
    -                    -       -     -    -232-    -....-
:    :    :    :    :    :    :    :    :    :    :    :    :
 END OF V.D.U. TESTING

PRINTER ...........: END OF TESTS..-SOFTWARE...: 23133847-7
PREPARATION........: END OF TESTS..-SOFTWARE...: 23134448-3N8AUM
LINE...............: END OF TESTS..-SOFTWARE...: 23134450-8MCAUK

V.D.U. TESTING...........:
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 %$Ø  * '()+,-./:=?
FIELD OPTIONS..: 11111111   (dependent on D.I.L switches)
ANSWERBACK.....: SAGEM TEST 01  (dependent on programmed A.B.)
STORAGE MEMORY.........: PROTECTED  (dependent on memory status)
```

Printed

```
PRINTER.............: END OF TESTS..-SOFTWARE...: 23133847-7
PREPARATION.........: END OF TESTS..-SOFTWARE...: 23134448-3N8AUM
LINE................: END OF TESTS..-SOFTWARE...: 23134450-8MCAUK

PRINTER TESTING...........:
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 %$Ø &* '()+,-./:=?
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 %$Ø &* '()+,-./:=?
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890 %$Ø &* '()+,-./:=?

FIELD OPTIONS...: 01111111

ANSWERBACK.....: MISSING

STORAGE MEMORY..........: PROTECTED
```

If during printing the printer unit fails or end of paper occurs the teleprinter shifts to "locked" mode.

PHASE 1V

Diagnostic

The following menu is displayed below previous display :-

```
INIT MEMORY.....: M?
INTEGRATED TEST.: T?
INIT TIME.......: H?
INIT DISK.......: F?        (disk machines only)
```

- If M key is depressed
  - message memory and abbreviated number tables are erased, number of blocks available are 232.

- If H key is depressed
  - time and date can be set.

.../...

. If F key is depressed

- if no disk in machine service line will display "NO DISK" and menu will be displayed

- if disk is in format will be checked and formatted if necessary and original menu displayed.

. If T key is depressed

- the following menu is displayed (test menu)

```
KEYBOARD TEST        :C?
LINE TEST            :L?
DRIVE TEST           :R?
DISK TEST            :D?
```

While in test mode

. If C key is depressed

- "KEYBOARD TEST....." is displayed
- Each time a key is depressed its binary code is displayed
- No action for 20 secs returns teleprinter to original menu

. If L key is depressed

- if 2 position switch (next to RAZ button) is in "0" position then "NON LOOPED LINE " is displayed on service line and original menu is displayed.

- if 2 position switch is in " 1 " position then "LINE TESTING..." is displayed and RY test starts. The RY test is displayed and printed.

- to stop RY test returns two position switch to " 0 " position. The original test menu will be displayed.

- If R key is depressed
  - if no disk present then "NO DISK" is displayed on service line
  - if disk is in then disk drive is checked and if operational original menu is displayed
  - if drive is faulty then "DISK ERROR" will be displayed on service line and original menu will be displayed (takes about 2 seconds)

- If D key is depressed
  - if no disk present then "NO DISK" is displayed on service line
  - if disk is in then disk read-write is checked and if operational original menu is displayed (takes about 56 seconds)

While in test mode (test menu displayed) if no key is depressed for 20 seconds the teleprinter will return to original menu.

While teleprinter is in diagnostic mode (original menu displayed) if no key is depressed for 20 seconds the teleprinter will revert to operational mode.

INTERPRETATION OF THE MEMORY FAULTS ** AND ++

RAM memory/fault 01 **

RESULT **	RAM POSITION
00 and 01	Z 3
02 and 03	Z 4
04 and 05	Z 5
06 and 07	Z 6
08 and 09	Z 7
10 and 11	Z 8
12 and 13	Z 9
14 and 15	Z 10

The 8 chips are situated on the MPU RAM REPROM board. The significance is the same for both the line and the preparation modules.

REPROM memory faults 02. + +

RESULT ++	REPROM POSITION	
00 to 13	MEF	)
04 to 07	MCD	)
08 to 11	MAB	) On the MPU RAM
12 to 14	M89	) REPROM board
16 to 19	M67	)
20 to 23	M45	) On the ATX extender board

It must be noted that part of RAM is used during self test. If a fault should occur in these sections then the MPU of the associated module may lock up and be unable to display test results.

MESSAGE MEMORY RAM

The RAM used as message memory is also checked but if found to be faulty will not be displayed as a fault during phase I.

The fault will be displayed at the end of phase III by inserting " CHECK OPTION XX - XX " into the service message position on the screen.

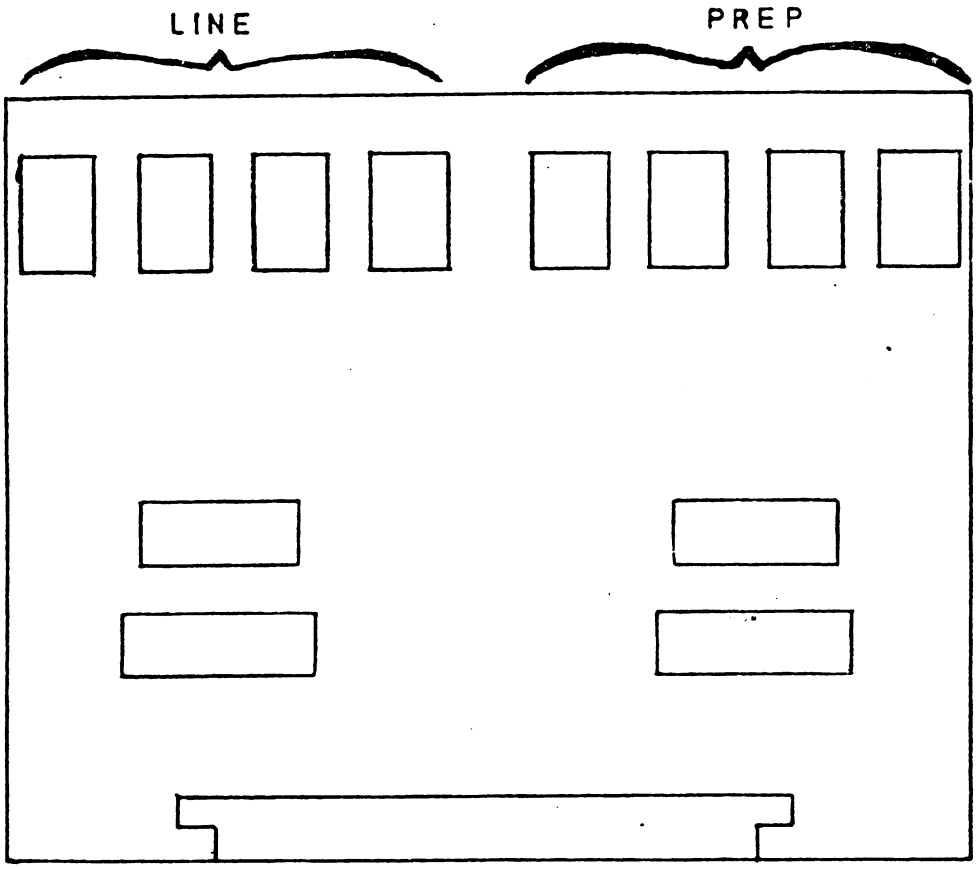
THE INTERPRETATION OF RAM FAULTS XX-XX

RESULT XX - XX	CARD + RAM POSITION		NUMBER OF AVAILABLE BLOCKS
01 - 06 & 07	LINE MPU	Z6	165 - 181
01 - 08 & 09		Z7	182 - 197
01 - 10 & 11		Z8	198 - 213
01 - 12 & 13		Z9	214 - 229
01 - 14 & 15		Z10	230 - 232
07 - 00 & 01	ATX BOARD	Z1	071 - 085
07 - 02 & 03		Z9	085 - 101
07 - 04 & 05		Z5	102 - 117
07 - 06 & 07		Z13	118 - 133
07 - 08 & 09		Z3	134 - 149
07 - 10 & 11		Z11	150 - 165
07 - 12 & 13		Z7	166 - 181
07 - 14 & 15		Z15	182 - 197
07 - 16 & 17		Z2	198 - 213
07 - 18 & 19		Z10	214 - 229
		Z6	230 - 232

The number of available blocks is the amount of space in message memory up to the first faulty RAM. A block is 128 characters.

TOOLING DEVICE

This device is an aid to the technician. It plugs onto the top of the ACIA ECHANGE - LECTEUR - PERFO board. (not presently supplied with the TX35)



The board has 8 digital LED arrays, 4 for the line unit and 4 for the prep unit.

The previous tables give a meaning for the array outputs during the auto test procedures.

The information shown on the arrays is drawn and decoded from the transfer bus.

AUTOMATIC TRANSMISSION - RETRY FACILITY

This facility is used to automatically transmit messages previously prepared.

To be transmitted automatically the message must have on the address line, the subscriber number and time of transmission. The clock must have been initialised.

When the led located on the automatic retry key is on the facility is activated. Depressing this key changes the status from on to off and vice versa.

When the teleprinter is in the idle mode a cycle is done every minute to check if there is a message to send. During this cycle the MPU looks at all the messages to be sent in order to detect the one or ones which have reached their time. Priority if more than one are present will be explained later on

This cycle does not occur if :-

- a transmission is being made
- a message is being received
- a message is being printed locally
- the printing unit is faulty

A cycle is automatically triggered after :-

- the printing unit is released
- transmission or reception of a message stops
- a message is entered into the message memory
- stand-by mode is left
- mains is recovered

During the cycle every message with a current transmission time or a time up to 8 hours previous to the current time is considered to be for immediate transmission, it is then taken by the transmission sequence which establishes the connection and according to the result of the transmission, gives the new status by updating the transmission time number of tries still to go, or T or J status.

If the next message to transmit is within the next 15 minutes stand-by mode will not occur before transmission of this message.

If the next message is in more than 15 minutes and less than 12 hours, stand-by mode is authorised and the TX35 will be automatically re-awakened by the clock at the time transmission must occur.

If a message is to be transmitted in more than 12 hours and less than 16 hours the teleprinter will be automatically awake in 12 hours and then at the time the message must be sent.

In order not to monopolise the TX35 on transmission a non-authorised transmission period exists that allows time to :-

- receive message
- transmit manually
- make local copy

Switch position 7 on the DIL switch allows this time to be set to 1 minute (for receiving and transmitting teleprinters) or 10 seconds (for transmitting only teleprinters)

PRIORITY OF TRANSMISSION

Priority order is based on the message transmission time. However, if two or more messages have the same time priority is given to the one which has least number of retry's. If equal, the priority goes to the one with the lowest message number.

TRANSMISSION TIME

This time is entered by the operator. If no time is entered by the operator then the time the message preparation started is automatically inserted.

When transmission of a message has not been successful the transmission time is updated. The new time is the time the unsuccessful call had been cleared plus three minutes. The priority of transmission of this message is the one of the new time.

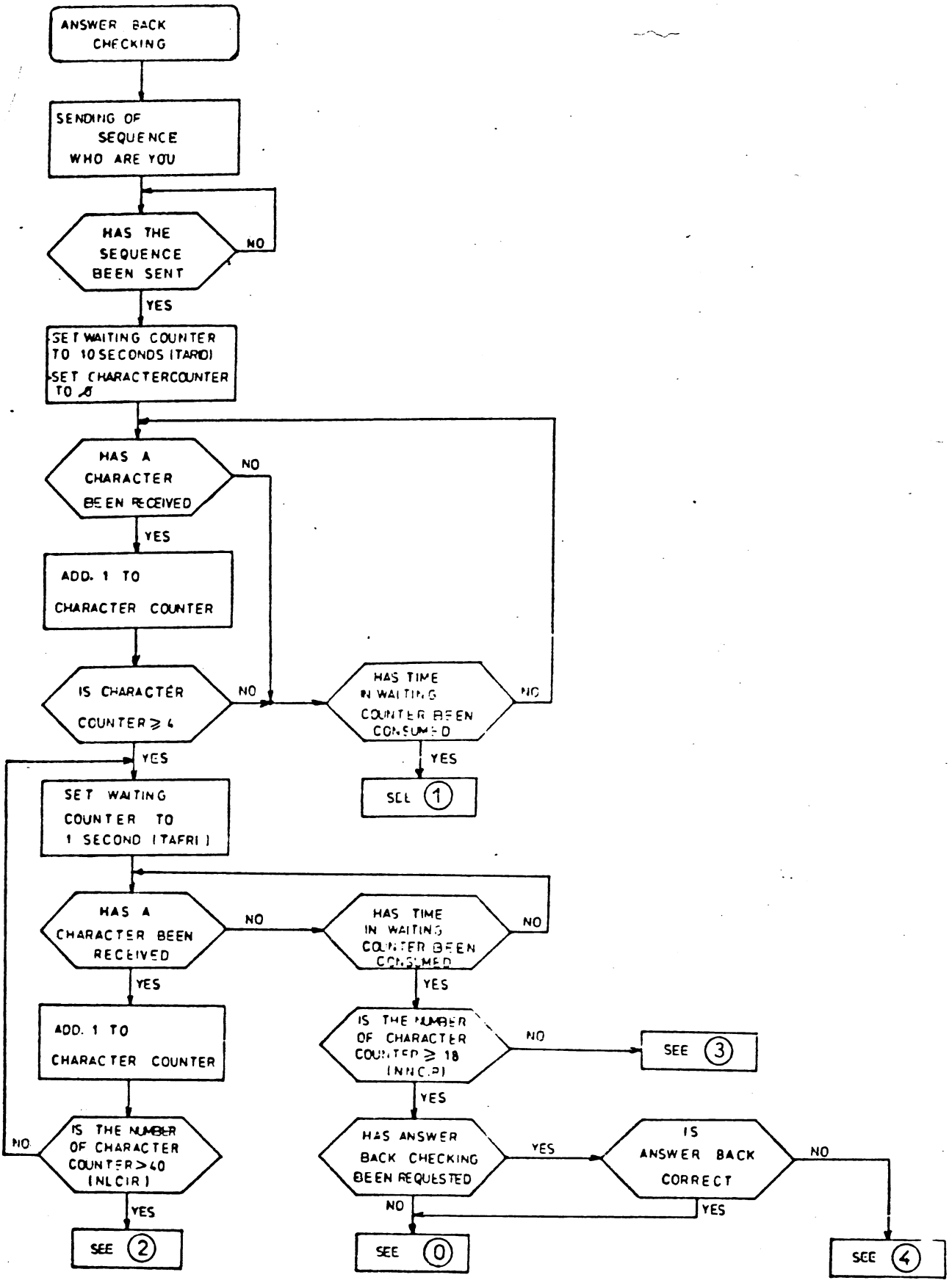
ANSWERBACK VERIFICATION

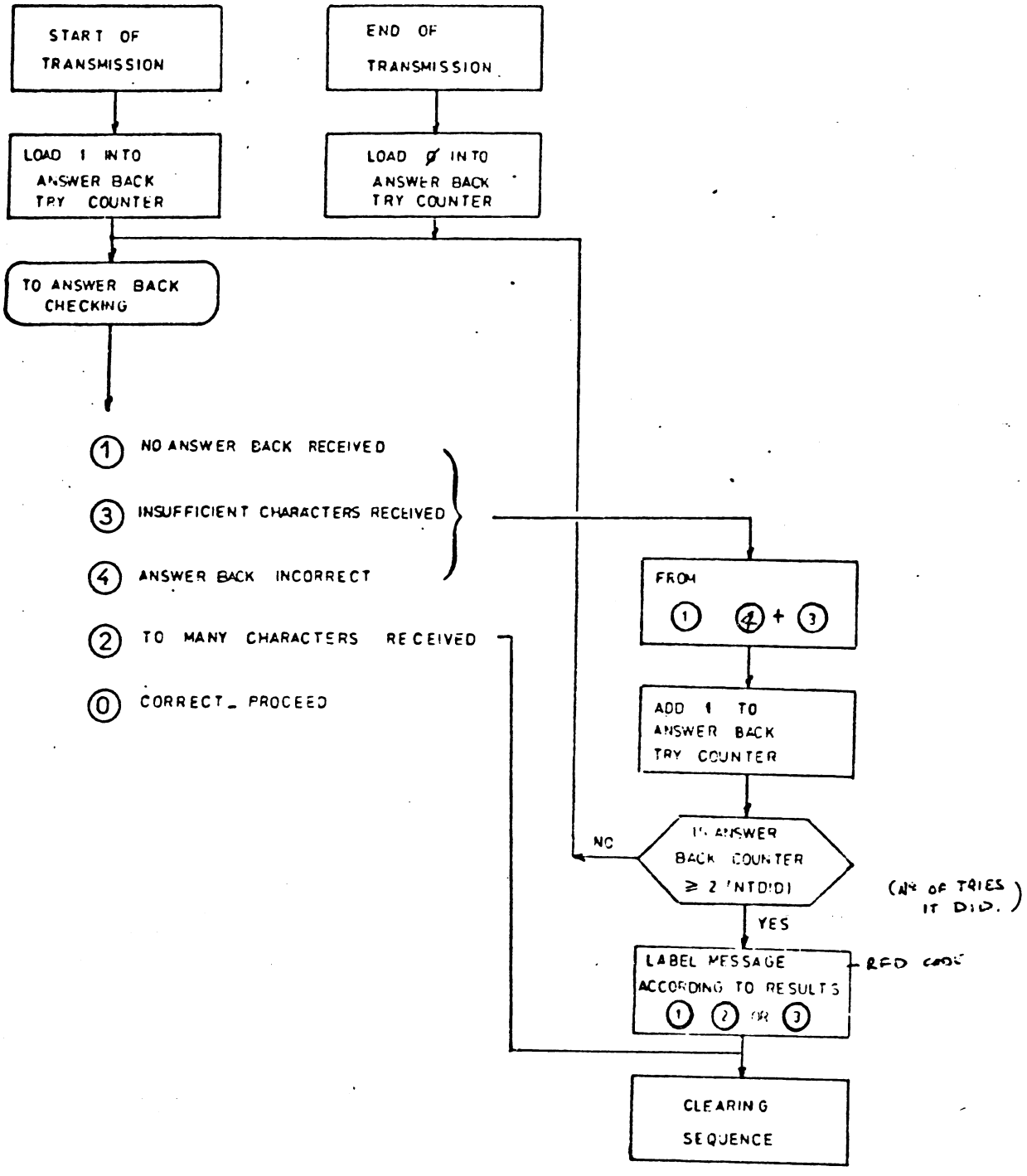
This verification is only done if the field on the address line has been filled and it is checked at the beginning and end of a call. The characters of the called party that are checked must be following characters of its answerback. The number checked could be between 1 and 7, letter shift, figure shift, line feed, carriage return and nul are not considered as characters.

When the WRU code (CR, LF, ↑ , ✠ ,) has been sent, the TX35 waits for 10 secs to receive the first four characters. When the number of 4 characters has been reached the timing drops to 1 second max between characters. After a silence of more than one second we assume that the answerback has been received. To be considered as valid an answerback must have at least 18 characters.

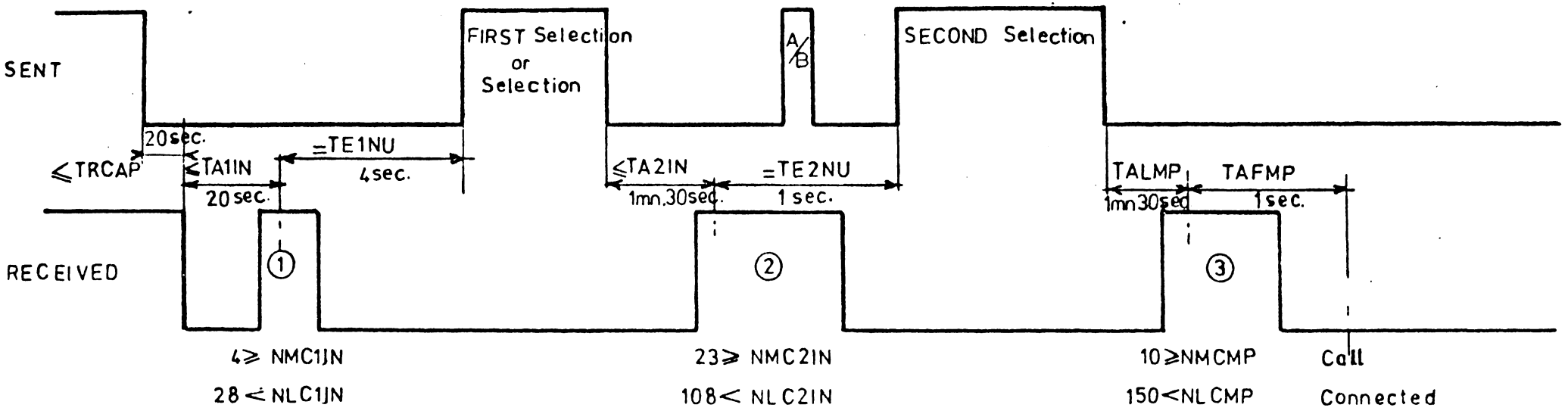
The number of characters received during an answerback must not exceed 40 characters otherwise a deconnection procedure automatically takes place.

If the receives answerback is valid and the part to check is present it is declared accepted if not a second WRU demand will be sent.


ANSWER BACK CHECKING
SENDING OF SEQUENCE WHO ARE YOU
HAS THE SEQUENCE BEEN SENT
NO
YES
SET WAITING COUNTER TO 10 SECONDS (TARDI)
SET CHARACTERCOUNTER TO 6
HAS A CHARACTER BEEN RECEIVED
NO
YES
ADD. 1 TO CHARACTER COUNTER
IS CHARACTER COUNTER ≥ 4
NO
HAS TIME IN WAITING COUNTER BEEN CONSUMED
NO
YES
SEE (1)
YES
SET WAITING COUNTER TO 1 SECOND (TAFRI)
HAS A CHARACTER BEEN RECEIVED
NO
HAS TIME IN WAITING COUNTER BEEN CONSUMED
NO
YES
YES
ADD. 1 TO CHARACTER COUNTER
IS THE NUMBER OF CHARACTER COUNTER ≥ 18 (NNCAR)
NO
SEE (3)
YES
NO
IS THE NUMBER OF CHARACTER COUNTER > 40 (NLCAR)
HAS ANSWER BACK CHECKING BEEN REQUESTED
YES
IS ANSWER BACK CORRECT
NO
YES
YES
NO
SEE (2)
SEE (0)
SEE (4)


START OF TRANSMISSION
END OF TRANSMISSION
LOAD 1 INTO ANSWER BACK TRY COUNTER
LOAD ∅ INTO ANSWER BACK TRY COUNTER
TO ANSWER BACK CHECKING
1 NO ANSWER BACK RECEIVED
3 INSUFFICIENT CHARACTERS RECEIVED
4 ANSWER BACK INCORRECT
2 TO MANY CHARACTERS RECEIVED
0 CORRECT_ PROCEED
FROM 1 4 + 3
ADD 1 TO ANSWER BACK TRY COUNTER
IS ANSWER BACK COUNTER ≥ 2 ?NTDID?
NO
YES
(Nº OF TRIES IT DID.)
LABEL MESSAGE ACCORDING TO RESULTS 1 2 OR 3
RED CODE
CLEARING SEQUENCE

AUTOMATIC MODE CONNECTION SEQUENCE



1. PROCEED TO SELECT SEQUENCE

   Minimum number of characters to be received NMC1IN during TA1IN period

   Maximum number of characters to be recieved NLC1IN

   When NMC1JN characters have been received followed by a duration = TE1NU, the sequence is to be considered finished

2. PROCEED TO SELECT SECOND SEQUENCE

   Minimum number of characters to be received during TA2IN period NMC2IN

   Maximum number of characters to be received NLC2IN

   A duration of silence = TERNU considers the sequence finished

3. ANSWER TO SELECTION OR SECOND SELECTION

   Minimum number of characters to be received during TALMP period NMCMP

   Maximum number of characters to be received NLCMP

   A duration of silence = TAFMP considers the sequence finished

RFD CODES (AUSTRALIAN CONDITIONS)

* - will not occur.

01 NO CALL CONFIRMATION RECEIVED

Possible reasons
* - exchange faulty
* - line faulty
* - transmission and reception of TX35 faulty

02 FIRST PROCEED TO SELECT PROTOCOLE FAULTY

Possible reasons
- not received
- typical sequence not received
- too many characters in the sequence
* - spurious pulses on network
* - procedure incorrect

03 TRANSMISSION OF FIRST SELECTION DISTURBED

Possible reasons
- break back received
- selection incorrect

04 SECOND PROCEDE TO SELECT PROTOCOLE FAULTY

Possible reasons
- not received
- typical sequence not received
- too many characters in sequence
* - spurious pulses on network
* - procedure not conforming
* - first selection incorrect

* 05 TRANSMISSION OF SECOND SELECTION DISTURBED

Possible reasons
- breakback received
* - spurious pulses on network
* - selection incorrect

* 06 CALL CONNECTED FAILURE

Possible reasons
* - procedure incorrect

07 "FAULT IN SELECTION" - wrong number in selection sequence
- No Answer Back received.

* 08 ANSWERBACK NOT RECEIVED DURING CONNECTION SEQUENCE

Possible reasons
- procedure error
- called party faulty

CAB or 09 ANSWERBACK INCORRECT

Possible reasons
- wrong called party
- checking field not properly labelled

* 10 ANSWERBACK NOT RECEIVED DURING CONNECTION PROCEDURE

Possible reasons
- called party faulty
- exchange disturbance

11 ANSWERBACK INCORRECT WHEN CHECKED DURING DISCONNECTION PROCEDURE

Possible reasons
- line disturbance

12 BREAK-BACK DURING TRANSMISSION

Possible reasons
- called party intervention
- spurious pulses on network

13 CALL CLEARED SIGNAL RECEIVED WHEN WAITING FOR FIRST PROCEED TO SELECT SIGNAL

Possible reasons
* - exchange disturbance

* 14 CALL CLEARED SIGNAL RECEIVED WHEN TRANSMITTING FIRST SELECTION

Possible reasons
* - contents of first selection incorrect

15 CALL CLEARED SIGNAL RECEIVED WHEN WAITING FOR SECOND PROCEED TO SELECT SIGN.

Possible reasons * - first selection faulty
* - second exchange not available

16 CALL CLEARED SIGNAL RECEIVED WHEN TRANSMITTING SECOND SELECTION

Possible reasons * - fault in the second selection

17 CALL CLEARED SIGNAL RECEIVED WHEN WAITING FOR CONNECTION CONFIRMED STATUS

Possible reasons * - typical sequence not received

18 CALL CLEARED SIGNAL RECEIVED DURING CONNECTION PROCEDURE

Possible reasons * - call cleared on called subscriber

19 CALL CLEARED SIGNAL RECEIVED DURING TRANSMISSION OF TEXT

Possible reasons * - call cleared by called subscriber

20 CALL CLEARED SIGNAL RECEIVED DURING DISCONNECTION PROCEDURE

Possible reasons * - call cleared by called subscriber

OCC-21 CALL CLEARED SIGNAL RECEIVED AS WELL AS OCC CODES

Possible reasons * - called party busy

NC-22 CALL CLEARED SIGNAL RECEIVED AS WELL AS NC CODES

Possible reasons * - no line available at level of exchange

ABS-23 CALL CLEARED SIGNAL RECEIVED AS WELL AS ABS CODES

Possible reasons * - called party absent
* - line temporarily removed

NA-24 CALL CLEARED SIGNAL RECEIVED AS WELL AS NA CODES

Possible reasons * - number not authorised

NP-25 CALL CLEARED SIGNAL RECEIVED AS WELL AS NP CODES

Possible reasons * - no party - you may have selected wrong number.

NCH-26 CALL CLEARED SIGNAL RECEIVED AS WELL AS NCH CODES

Possible reasons * - subscriber number has changed

DER-27 CALL CLEARED SIGNAL RECEIVED AS WELL AS DER SIGNALS

Possible reasons * - temporarily unavailable (paper low etc)

MOM-28 MOMENT - MANUAL OPERATOR

use manual call mode

* RDI-29 NOT USED IN AUSTRALIA

* - call diverted to another number

30 PRINTING UNIT FAULTY DURING CONNECTION PROCEDURE

Possible reasons * - paper out
- printhead lock
- other printing unit failure

31 PRINTING UNIT FAULTY DURING MESSAGE TRANSMISSION

32 PRINTING UNIT FAULTY DURING DISCONNECTION PROCEDURE

33 LINE FAILURE DURING CONNECTION PROCEDURE

Possible reasons * - received line open
* - maintenance switch rotated

34 LINE FAILURE DURING TRANSMISSION OF MESSAGE

Possible reasons * - received line open
* - maintenance switch rotated

35 LINE FAILURE DURING DISCONNECTION PROCEDURE

Possible reasons
* - received line open
* - maintenance switch rotated

36 DISK FAILURE DURING CONNECTION PROCEDURE - NOT USED

Possible reasons
* - door open
* - drive faulty
* - floppy disk faulty, etc.

37 DISK FAILURE DURING TRANSMISSION OF MESSAGE

Possible reasons
* - door open
* - drive faulty
* - floppy disk faulty, etc.

38 DISK FAILURE DURING DISCONNECTION PROCEDURE

Possible reasons
* - door open
* - drive faulty
* - floppy disk faulty, etc

42 CLEARING OF CALL SENT BY OPERATOR DURING CONNECTION PROCEDURE

43 CLEARING OF CALL BY OPERATOR DURING TRANSMISSION OF MESSAGE

44 CLEARING OF CALL BY OPERATOR DURING DISCONNECTION OF MESSAGE

SAGEM PONTOISE

FICHE TECHNIQUE T× 35

N° 140
FOLIO /
DATE
NOM

CAUSES DE FIN DE COMMUNICATION

Ces causes sont mentionnées dans la ligne d'action et éditées par l'imprimante en fin de communication - EXEMPLE : CFC = OCC 3

Remarques : * indique qu'une pause de 15 mn sera effectuée quand la moitié des tentatives aura été épuisée
• indique qu'il n'y aura plus d'autres tentatives

LIBELLE DE LA CAUSE	CAUSE	ORIGINES POSSIBLES	NOMBRE DE TENTATIVES MAXIMAL	PAUSES ENTRE TENTATIVES
OCC	Abonné occupé	Abonné occupé	8	5 mn *
NC	Pas de circuit	Pas de circuit disponible	8	5 mn *
ABS	Abonné absent	Abonné absent	2	1 mn
NA	Non admis	Numéro non admis, non autorisé	2	1 mn
NP	Non relié	Abonné non relié, suspendu ou résilié	2	1 mn
NCH	Numéro changé	Numéro changé	2	1 mn
DER	Dérangement	Abonné en dérangement	2	1 mn
MOM	Demande d'abonné	Position manuelle du central	2	1 mn
01	Non confirmation d'appel	voie de transmission en défaut	3	10 mn
02		Réception défectueuse	10	3 mn
04	Défaut de protocole en 2ème invitation à numéroter	réseau perturbé procédure inadéquate 1ère sélection incorrecte	10	2 mn.
07	Défaut de mise en présence	défaut de sélection	3	2 mn.
08	Non réception d'indicatif en début de communication	défaut de procédure Abonné en dérangement	2	2 mn
09	Réception en début de communication d'un indicatif non conforme	Erreur de sélection L'abonné appelé dans la zone contrôlée l'indicatif de la ligne d'action inadéquat	2	2 mn
10	Non réception d'indicatif en fin de communication	Abonné en dérangement Défaut des réseaux	2	2 mn

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SAGEM PONTOISE

FICHE TECHNIQUE Tx 35

FOLIO /
DATE
NOM

LIBELLE DE LA CAUSE	CAUSE	ORIGINES POSSIBLES	NOMBRE DE TENTATIVES MAXIMAL	PAUSE ENTRE TENTATIVES
11	Réception en fin de communication d'un indicatif non conforme	Voies de communication perturbées	2	2mn
12	Contre-indication au cours de l'émission du texte	Intervention de l'abonné appelé Voies de communication perturbées	3	2mn
13	Libération reçue en phase d'appel	Libération reçue avant la 1ère numérotation	6	1mn *
14	Libération reçue pendant l'émission de la 1ère numérotation	Défaut du canton de la 1ère sélection	6	1mn *
15	Libération reçue en attente de 2ème invitation à numéroter	Défaut de la 1ère sélection Central intermédiaire indisponible	6	1mn *
16	Libération reçue pendant l'émission de la 2ème numérotation	Défaut du canton de la 2ème sélection	6	1mn *
18	Libération reçue en attente de fin de mise en présence	Procédure inadaptée Déconnexion par l'appelé	6	1mn *
19	Libération reçue au cours de l'émission du texte	Déconnexion par l'appelé	6	1mn
20	Libération reçue en phase de déconnexion	Déconnexion par l'appelé	6	1mn
30	Absence de papier page	Absence de papier page	•	
31 32	Défaut imprimante du téléimprimeur	Blocage de la tête d'impression Panne de l'imprimante Fin de papier page	10	1mn
33	Défaut ligne en phase d'appel	Commutateur de maintenance	X 2	
34 35	Défaut ligne du téléimprimeur	Commutateur de maintenance	10	1mn
39	Défaut en phase d'appel	Blocage en phase d'appel	•	
40 41	Défaut du téléimprimeur	Blocage du téléimprimeur	10	1mn
42	Déconnexion en phase d'appel	Libération effectuée par l'opérateur	•	
43	Déconnexion en émission	Libération effectuée par l'opérateur	•	
46	Déconnexion en phase de fin	Libération effectuée par l'opérateur	•	-----

2001655A-0

BREAK BACK

The TX35 stops transmitting for one second every time a character is received while transmitting from the memory.

If during this second no other characters are received the sequence XXXXXX will be printed where the line had been interrupted, and the TX35 continues to transmit from the start of the interrupted line.

If the number of characters received is higher, depending on the type of transmission, the reaction is as follows :-

MANUAL TRANSMISSION (CALL/CLEAR)

The keyboard is locked and the operator makes a decision to either unlock the keyboard and continue to transmit or to give the other party the hand, or clear the call.

SEMI-AUTOMATIC TRANSMISSION (AUTOMATIC CALLING)

Transmission stops for 10 seconds and starts again (after inserting XXXXXX) at beginning of interrupted line. However, the call is automatically cleared if transmission is stopped more than twice or if the number of characters received is higher that 127.

AUTOMATIC TRANSMISSION (AUTOMATIC RE-TRY)

As above.

APPENDIX.2.

FLOPPY DISK CARE AND HANDLING

The floppy disk is permanently packaged in a protective vinyl jacket, but some surfaces of the disk media are exposed. When not in use the disk is stored in a protected envelope. Instructions regarding general use, storage and environmental considerations are listed below.

Disk Usage

* To remove disk from envelope grasp disk by its upper edge and pull.

* When inserting disk into disk drive opening, don't force if resistance is encountered. Make sure disk is fully inserted before closing the door. This will prevent damage to the centre hole of the disk.

* Be careful not to touch exposed areas of the media when the disk has been removed from its protective envelope. Handle by jacket only.

* Don't eat, drink or smoke while handling the disk. Fluids, fingerprints, hair, dust and smke particles can all contaminate the disk surface. If a substance is spilled on the sk jacket, it can be removed and the data recovered providing the contaminant doesn't reach the recording surface.

* Replace the disk if it becomes contaminated. If a contaminated disk used, the Read/Write head on the disk drive can become contaminated causing Read/Write errors. The contaminants can also be passed onto clean disks used in the drive.

* Don't place heavy objects on the disk, or fold or bend it. Paper clips, rubber bands and tape should not be used on the disk. Disks which become torn, folded or creased should be replaced.

* Disks should not be placed near magnetized objects or data can be lost eg Telephone receiver handpieces. Motors and powercalbes can also affect disks.

* Never write on the disk jacket. Self-adhesive labels should be used for disk identification (don't apply label over any areas of exposed media). Write on label before placing it on the jacket and use only felt tipped pens. Don't use pencil as graphite particles or erasure residue can cause contamination.

Storage

* Return the disk to its envelope as soon as it is removed from the disk drive.

* Disks should be stored in specially designed containers, preferably the box that they came in.

Environmental Conditions

* Don't expose disks to direct sunlight or excessive heat. Don't store disks in motor vehicles, where extreme conditions can occur.

Diskette Head Cleaning

In order to keep valuable information stored on the diskettes, intact and error free, it may be necessary to occasionally clean the disk drive head. There are two ways of cleaning contaminated disk heads.

1. In cases of minor contamination of disk heads, special cleaning diskettes are used. Several manufacturers offer this product which usually consists of the cleaning diskettes and (not always) a bottle of cleaning fluid. Some diskettes are reusable and provide 10 - 15 cleaning runs, while others are disposable after use.

   The usual procedure is to saturate the cleaning diskette with cleaning fluid, slot it into the drive and engage the head for about 30 seconds. This is done by pressing the DISC switch followed by pressing DISPLAY 00 (in fact any message number will do). This should eliminate particles of dirt, dust and oxide that accumulate with normal use of the system. Also, this is the best and quickest way to clean diskette heads without any disassembly or mess.

   It is important to note that this should not be done too often (say every day) as friction can cause excessive wear of the disk head.

   Some of the more commonly available cleaning kits are listed below:

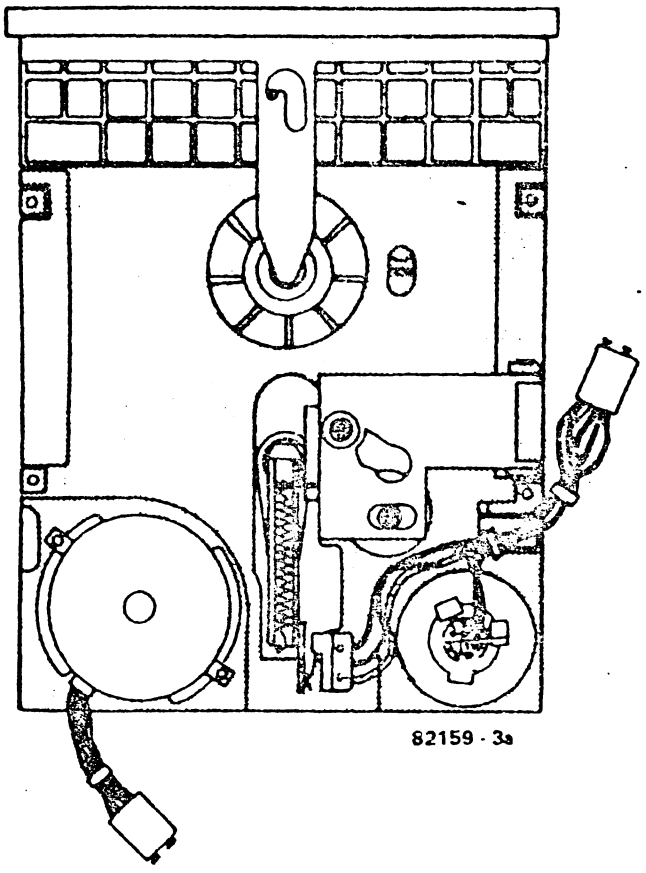
   Datalife - by Verbatim. Includes a special plastic jacket and 2 presaturated disposable cleaning disks. Replacement disks (without jacket) can then be purchased in packs of 10.

   3M - by Scotch. Includes special cleaning fluid and 2 reusable cleaning disks. Each disk can handle up to 15 cleanings.

   Floppiclene - by Electrolube. Includes a bottle of cleaning fluid, protective glove and 50 disposable cleaning diskettes.

2. In cases of severe contamination of disk heads, cleaning diskettes should be used as a first measure. However, if it proves to be unsuccessful (after 2 - 3 runs) disk heads should be cleaned with cotton buds immersed in isopropyl alcohol (electronic grade). While cleaning the head, cotton buds should be moved in the direction of rotation of the disk thus minimising the possibility of damage. Note, that this is a very delicate operation and should be performed very carefully as excessive pressure can cause the misaligment of the head.

3



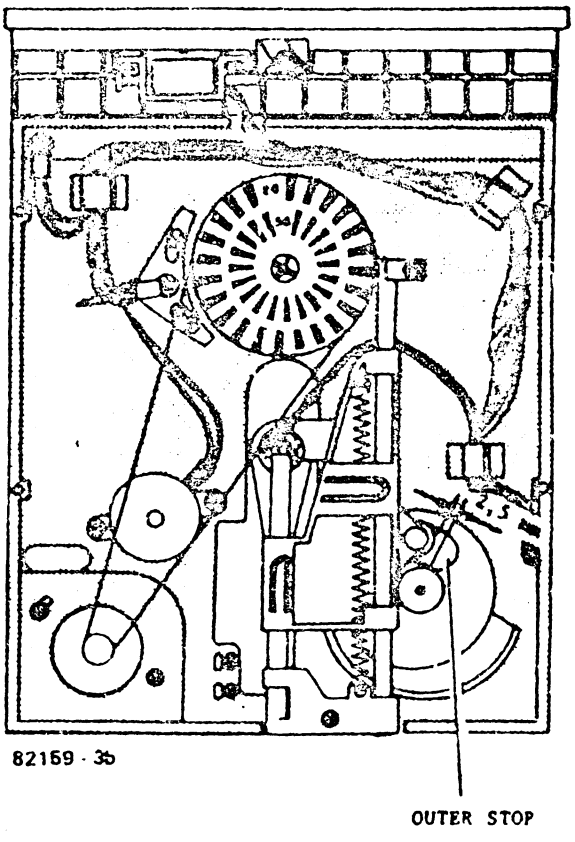


Figure 3a shows a Shugart drive and figure 3b shows a BASF drive.

4

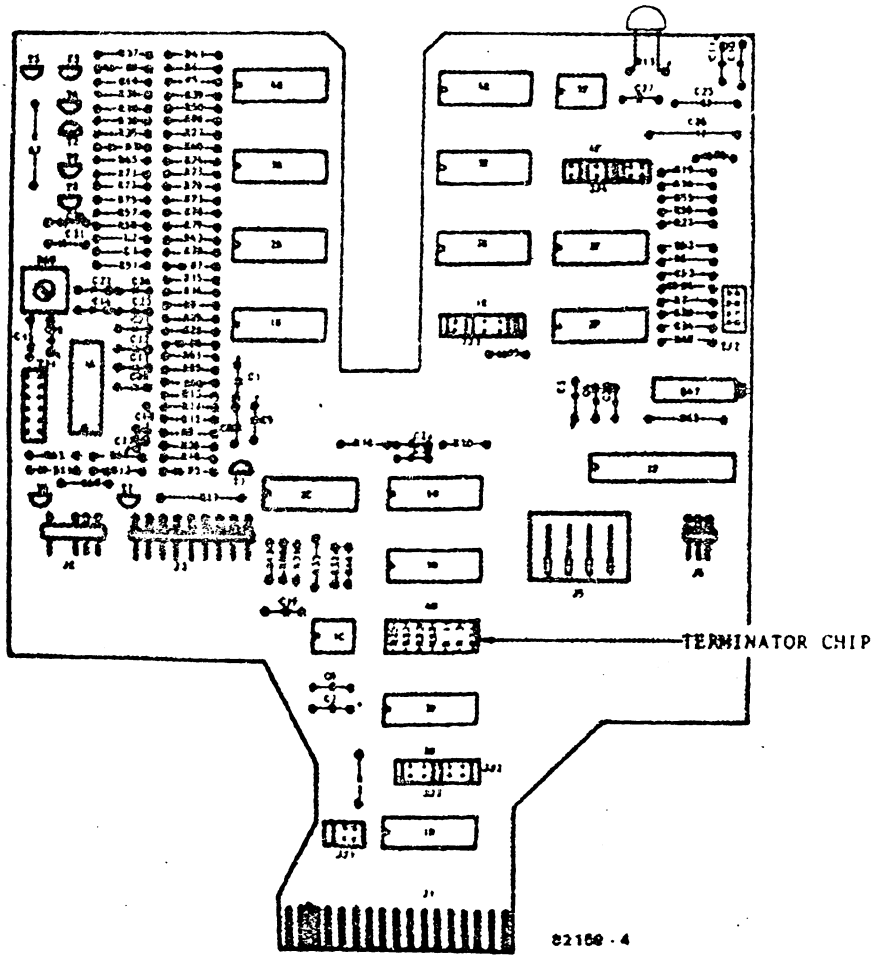


Figure 4. This is the component side of a BASF 6106 drive. The computer transmits and receives data to and from the drive via J1. Plug JJ1 is in position 'A'. The plug of JJ1 must always be in the position shown when a drive is used.

Thus the computer can only write data onto the diskette or read data from it when the door is closed.

Diskettes can be protected against accidental overwriting. As can be seen in figure 2, there is a notch in one side of the diskette. An optoelectronic device in the floppy disk drive monitors this notch to establish whether it is open or covered. If the notch is covered the diskette is protected against accidental overwriting. If the programme attempts to write data onto a write protected diskette the DOS issues an error message.

Any floppy disk drive can be utilized in principle. The only condition is that the input/output connector of the drive must be Shugart-compatible. Most 5 1/4 inch drives meet this requirement. We have tested the DOS both with Shugart and BASF drives. The only difference between the two drives is that the read/write head with Shugart is positioned by means of a spindle drive, while BASF use a helix. Figure 3a shows the mechanism of a Shugart drive and figure 3b shows that of a BASF drive.

Both drives are equipped with two motors:

– a drive motor and
– a stepper motor.

The drive motor rotates the floppy disk at a constant speed of 360 rpm. The drive motor is connected to an electronic regulator which keeps the rotational speed of the diskette constant even in the event of load variations. The rotational speed of the diskette can be varied within certain limits on both

drives. The second motor is a stepper motor which handles the positioning of the read/write head of the drive. This motor is also connected to electronic control circuitry. The control circuitry is fed with pulses by the computer. Each pulse switches the stepper motor one step further. Another line is connected between the computer and the control circuitry of the stepper motor. The potential on this line determines whether the stepper motor is to move the read/write head outwards from the interior or vice versa.

The drive chassis also contains three other electromechanical components:

As its name implies, the task of the head-load solenoid is to lower the read/write head onto the magnetic surface of the diskette. If the head-load solenoid is not activated, the read/write head is raised from the surface of the diskette by a spring. On the BASF drive the head is rigidly mounted. A felt pressure disk presses the magnetic surface of the diskette against the head.

Two optoelectronic sensors are located on the drive chassis. One of these sensors emits a pulse when the read/write head is over 'track zero' (described in more detail at the end of the article). Track zero is a special recording track on almost all floppy disk drives.

The second sensor monitors the index hole which is punched in the diskette. The index hole (see figure 2) is the absolute zero mark of the diskette or, to put it another way, the 'zero degree mark' on the round plastic disk. The index hole serves to inform the computer when the diskette has made a full revolution. Thus at 360 rpm an index pulse is emitted every 166.66 ms.

To summarize, therefore, a floppy disk drive consists of the following components:

- A stepper motor for positioning the read/write head
- A drive motor to rotate the diskette at a constant speed
- An optoelectronic sensor that checks whether the read/write head is positioned over track zero
- An optoelectronic sensor that establishes whether the diskette is write-protected
- An optoelectronic sensor that monitors the index hole and emits a pulse every full revolution
- A head-load solenoid that lowers the read/write head onto the magnetic surface of the diskette.

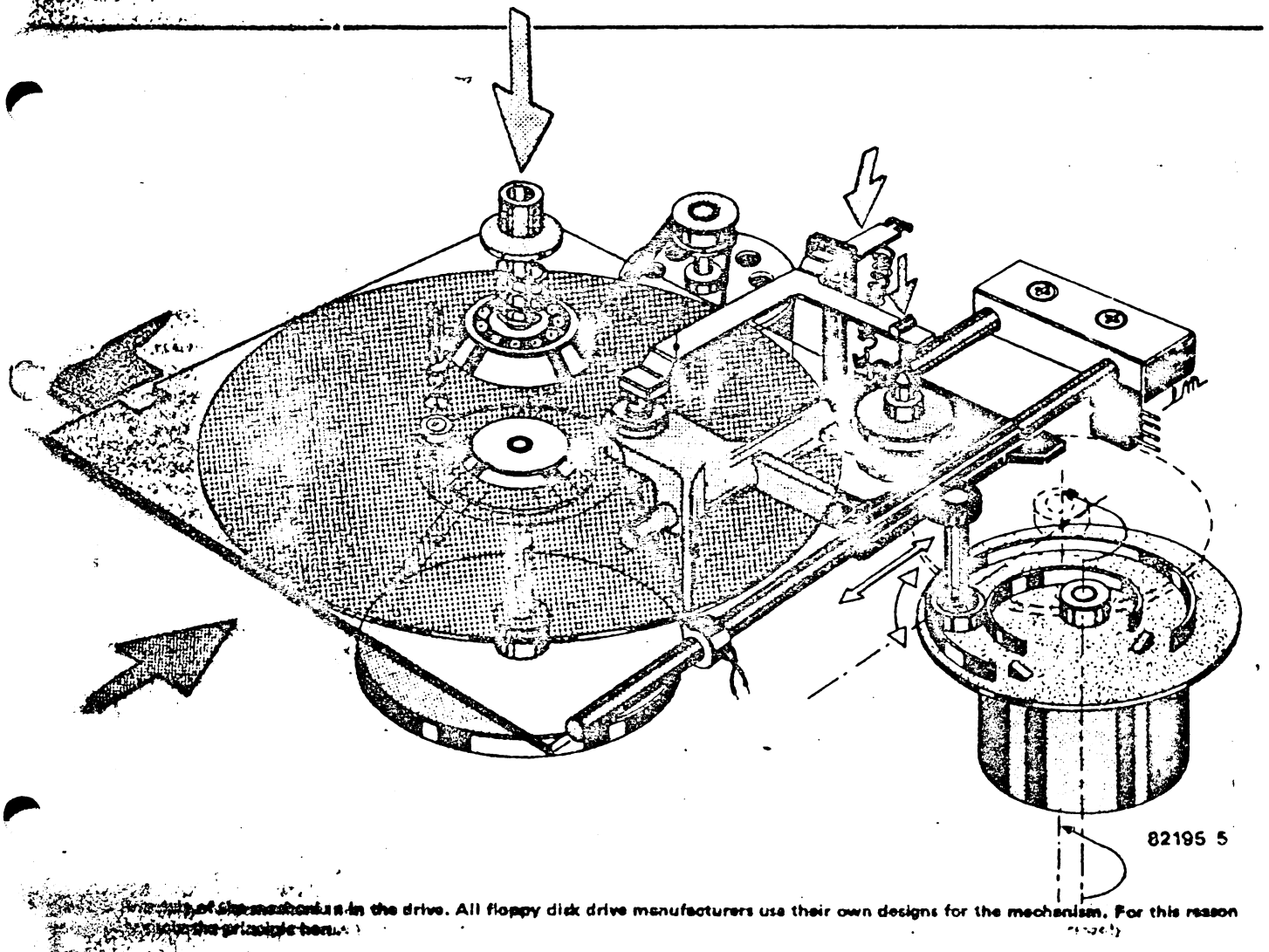
Clearly, a good deal of electronic circuitry is required to control all the electromechanical components on the drive chassis. Read/write amplifiers are also required for the head in the drive. These amplifiers can be compared with the recording and playback amplifiers in a conventional tape recorder. However, the read/write amplifier in the drive must be able to process frequencies of approximately 125 kHz, because the baud rate for our floppy disk interface is 125 kilobaud.

All this extensive circuitry is installed in a floppy disk drive and obviously contributes to its high cost. Usually the electronic circuitry in the drive is presligned. There is therefore no difficulty involved in connecting a drive to the Junior Computer. Figure 4 shows the printed circuit board for a BASF drive. Only two connectors are important to the user: J1 and J5.

Connector J1 is the Shugart-compatible connector of the drive. All control signals of this connector have TTL levels. All control signals emitted by the floppy disk interface are fed to the electronic circuitry in the disk drive via J1.

Connector J5 is also Shugart-compatible and is utilized for the supply of power. The disk drive requires two voltages: 12 V/800 mA and 5 V/300 mA. Since the power consumption of a DOS computer is fairly high, we shall examine the question of power supplies in a future issue of Elektor.

Any user wishing to connect two or more drives to his computer must also



82195 5

Fig. 3. Overview of the mechanics in the drive. All floppy disk drive manufacturers use their own designs for the mechanism. For this reason only the principle here.

take into account connector JJ1 and the terminator chip:
The terminator chip contains eight pull-up resistors and is always located in the last drive, when more than one are connected. When two drives are connected to the Junior Computer, drive A (the first one) has no terminator chip whilst drive B (the last one) contains the terminator chip. If, for example, four drives are to be connected to the Junior Computer, drives A . . . C contain no terminator chips whilst drive D (the last one) contains a terminator chip.
The drive designated as A, B, C or D is selected on JJ1 with the shorting plug. Drieve A is selected with the position shown. The following plug positions are assigned to drives B and C. Drive D does not require a shorting plug because it is clearly identifiable by the terminator chip.
Resistor R69 is for fine adjustment of the read amplifier. This resistor should never be readjusted. The quality of the read signal depends on it (freedom from jitter).

Drive mechanism

Figure 5 shows a sketch of a drive mechanism. The floppy disk is rotated by the drive motor like a record. The head makes contact with the surface of the diskette and converts the magnetic field fluctuations in the gap to an electrical signal. Recording on the diskette and playback from it ('writing and reading') are accomplished using the same principle as for a tape recorder or cassette recorder.
Since there are no grooves on the magnetic surface of the diskette, the head cannot follow a groove as on a music record. The head is therefore positioned over the desired track by a stepper motor. The stepper motor moves the head, which is mounted on a carriage, from track to track. The head can be moved over the surface of the diskette from the exterior to the interior or vice versa by means of the carriage. Since the surface of the diskette becomes worn fairly rapidly, the head is raised from the surface after every read or write operation. If the head is positioned on the surface of the diskette the term used is 'loaded head'. If it is not on the surface, this condition is an 'unloaded head'. The head can be lowered onto the surface of the diskette or raised from it by means of a spring and the head-load solenoid. If the head is continuously positioned on the surface of the diskette, the track will be destroyed after approximately 50 hours of operation. Since the head is normally only loaded for a short period, the service life of a diskette extends to several years.

Sectoring of a floppy disk

We shall now describe the way in which the data are stored on a diskette. With

6

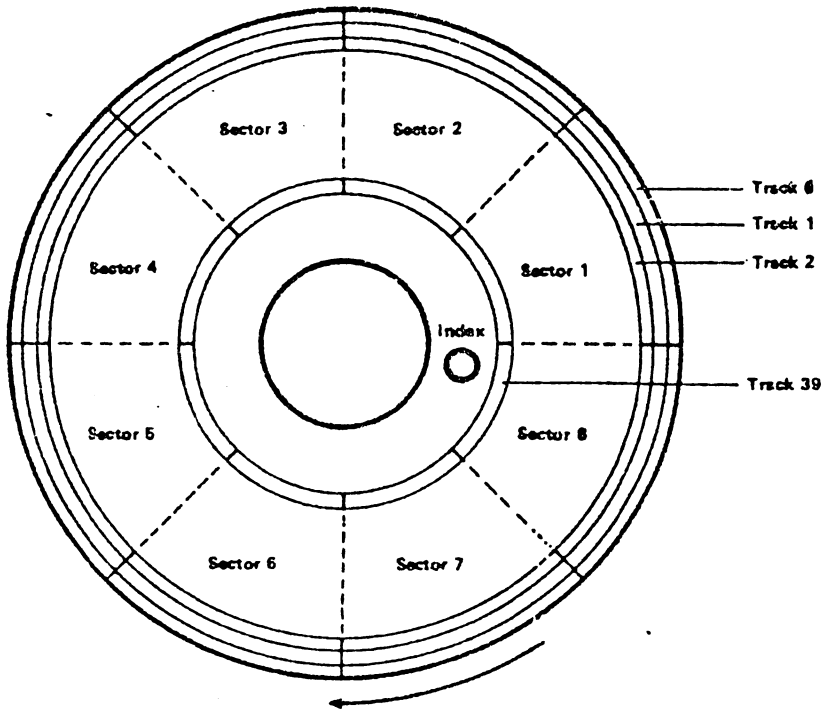


Figure 6. The data are written on the diskette in concentric circles. These circles are known as tracks. Each track has a number. A diskette usually accommodates 40 tracks. The tracks can be subdivided into groups known as sectors. The index hole is the start mark for all sectors of a track.

7

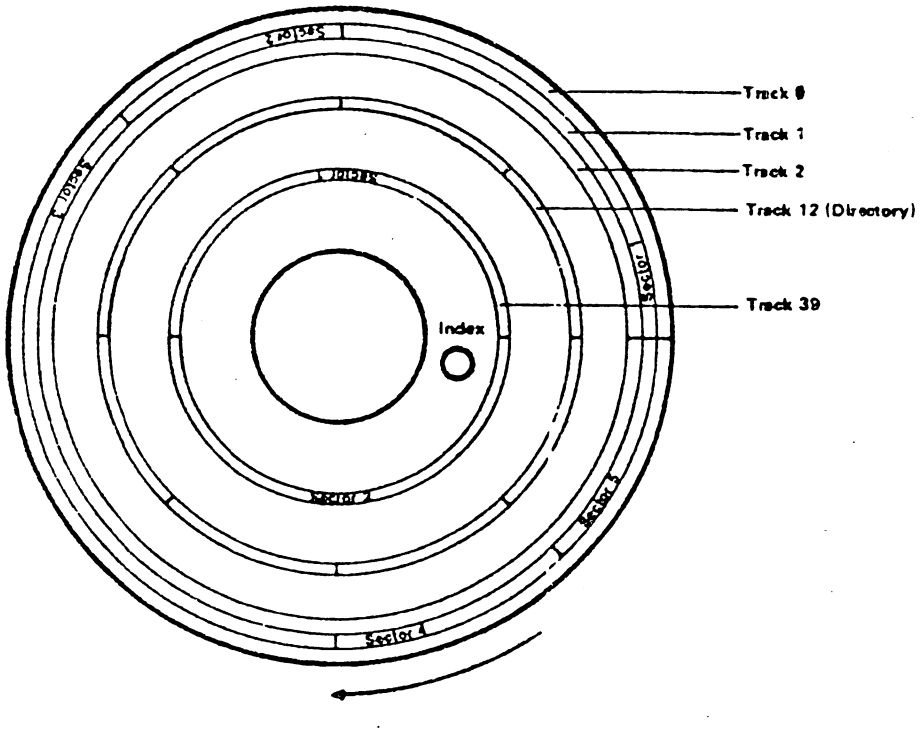


Figure 7. With soft-sectoring, the sectors can be of different lengths. In the extreme case a track consists of one or eight sectors. Track 12 is reserved for the directory with the Junior Computer.

APPENDIX.3.

3. Switch and Strap Settings

3.1 TX35 teleprinters are supplied under contract with all switch and strap settings made appropriate for telex installation.

3.2 CARTE INTERFACE IMPRIMANTE

Jumper SW1 - Not Used.
Jumper SW2 - Not Used.
Jumper SW3 - Not Used.

Jumper SW4 - Set to position 2
Position 1 - Tractor Feed
Position 2 - Friction Feed

Jumper SW5 - Set to position 1
Position 1 - Seven needle print head
Position 2 - Nine needle print head

3.3 CARTE INTERFACE VISUALISATION

Jumper S1 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing.

Jumper S2 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

3.4 CARTE MPU RAM EPROM

Jumper S1 - Set to position 1
Position 1 - Working position
Position 2 - EPROM programming *

Jumper S2 - Set to position 1
Position 1 - Working position
Position 2 - Maintenance testing

Jumper S3 - Set to position 1
Position 1 - Working position
Position 2 - EPROM programming *

* with external programming device.

Strap S45 - Not to be fitted
In - Enables EPROM M45
Out - Disables EPROM M45

Strap S67	-	Not to be fitted for preparation software (4 chip set)
	-	To be fitted for line software (5 chip set)
In	-	Enables EPROM M67
Out	-	Disables EPROM M67

3.5 CARTE EXTENSION ATX

Jumper S5	-	Set to position 1
Position 1	-	Working position
Position 2	-	Maintenance testing
Jumper S6	-	Set to position 1
Position 1	-	Working position
Position 2	-	EPROM programming *

* with external programming device.

3.6 CARTE INDICATIF + COMMANDE ADAPTATION

Jumper S1	-	Set to position I
Position I	-	Printing Unit
Position LPI	-	Reader, Punch and Printing Unit.
Jumper S2	-	Set to position 1
Position 1	-	Working position
Position 2	-	Maintenance testing
Jumper S3	-	Set to position 75
Position 75	-	75 baud if 75 baud selected on interface board.
Position 150	-	150 baud if 75 baud selected on interface board.
Jumper S4	-	Set to position 100
Position 100	-	100 baud if 100 baud selected on interface board.
Position 200	-	150 baud if 100 baud selected on interface board.
Jumper S5	-	Set to position TX
Position PP	-	No outgoing call/clear
Position TX	-	Outgoing Call/clear
Jumper S6	-	Set to position NEF
Position EFA	-	Call clear pulse
Position NEF	-	No call clear pulse
Jumper S7	-	Set to position TX
Position PP	-	No incoming call/clear
Position TX	-	Incoming call/clear
Switch SW0	-	Operator to select
Position A	-	Transmitted messages not erased
Position B	-	Erase transmitted messages.

Switch SW1 - Operator to select
Position A - No storage of received messages
Position B - Store received messages

Switch SW2 - Operator to select
Position A - Single line feed
Position B - Double line feed

Switch SW3 - Operator to select
Position A - 2 line feed page up
Position B - 6 line feed page up

Switch SW4/1 - Set to position 1 if disk option fitted otherwise set to position 0
Position 1 - Disk option enabled
Position 0 - Disk option disabled

Switch SW4/2 - Set to position 1
Position 1 - Retry facility enabled
Position 0 - Retry facility disabled

Switch SW4/3 - Set to position 1
Position 1 - Momentary audible alarm
Position 0 - Continuous audible alarm

Switch SW4/4 - Set to position 1
Position 1 - Answerback not required before text.
Position 0 - Answerback to be sent before text

Switch SW4/5 - Set to position 1
Position 1 - keyboard selection
Position 0 - dial selection

Switch SW4/6 - Set to position 1
Position 1 - Figures "D" not stored
Position 0 - Figures "D" stored

Switch SW4/7 - Set to position 1
Position 1 - No retry message priority
Position 0 - Retry message priority

Switch SW4/8 - Set to position 1
Position 1 - 3 or 4 wire circuit
Position 0 - 2 wire circuit

3.7 RACCORDEMENT D'EXPLOITATION
(Line connection module, main board)

Switch SW1 - Set to position 0
Position 0 - Working
Position 1 - Testing

Jumper S1 - Set in position 2
Position 1 - Surge arrestors connected to OA
Position 2 - Surge arrestors connected to OTG

3.8 CARTE PARAGOUDRE LIGNE
(line protection board)

Jumper S1 - Set in position 1
Position 1 - OB not connected to OTG
Position 2 - OB connected to OTG

3.9 CARTE FORMATEUR DISQUE SOUPLE

Jumper S1 - Set in position FDC
Position FDC -
Position PIA -

Jumper S2 - Set in position DD
Position DD -
Position SD -

Jumper S3 - Set in position M1
Position M1 -
Position M2 -

Jumper S4 - Set in position CLK
Position CLK -
Position HE -
Position TE -

Jumper S5 - Set in position 1
Position 1 -
Position 2 -

Jumper S6 - Set in position 0
Position 0 -
Position 1 -

Jumper S7 - Set in position 1
Position 0 -
Position 1 -

Jumper S8 - Set in position MX
Position MX -
Position DS2 -

Jumpers S9 - Set in positions DL and 34
Position DL -
Position 34 -
Position 10 -
Position 0 -

3.10 Disk Drive

Strap DS0 - Not to be fitted
In -
Out -

Strap DS1	-	To be fitted
In	-	
Out	-	
Strap DS2	-	Not to be fitted
In	-	
Out	-	
Strap DS3	-	Not to be fitted
In	-	
Out	-	

3.11 CARTE ADAPTATION TG4

Switch SW1	-	Set in position 50
Position 50	-	50 baud
Position 75	-	75 baud
Position 100	-	100 baud
(see also 3.6)		
Switch SW2	-	Set in position W
Position W	-	Working
Position O	-	Line Open
Position L	-	Line Looped
Position E	-	Earth
Position T	-	Line Transposed
Switch 4	-	Set in position 2
Position 1	-	Space on line (Xmt)
Position 2	-	Mark on line (Xmt)
Switch 5	-	Set in position 2
Position 1	-	With proceed to select
Position 2	-	Without proceed to select
Switch 6	-	Set in position 2
Position 1	-	With Call Connect
Position 2	-	Without Call Connect
Switch 7	-	Set in position 2
Position 1	-	Space on line (Receive)
Position 2	-	Mark on line (Receive)

3.12 CARTE MODEM INTERFACE

4. Preparation

4.1 After unpacking the TX35 teleprinter the following items must be fitted.

(a) Ribbon cassette
(b) Paper spindle and paper roll
(c) Wire paper deflector
(d) Power cable
(e) Floppy disk (if option fitted)

Welcome to the world of sophisticated office technology.

Telecom Telex 2000 offers you versatility and freedom through the most advanced facilities.

Working similarly to a word processor, Telecom Telex 2000 enables significant economies of time.

Not only do you save filing, you save keyboard time.

Telecom Telex 2000 is designed for easy operation and it stylishly blends into the most contemporary office.

Telecom Telex 2000 takes you into the 21st century.

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The Telecom TELEX 2000 Teleprinter combines the functions of a conventional teleprinter with the facility to prepare messages on a visual display screen and store these messages in a memory for subsequent transmission without the use of punched tape. The principal features of the teleprinter are detailed in the following pages.

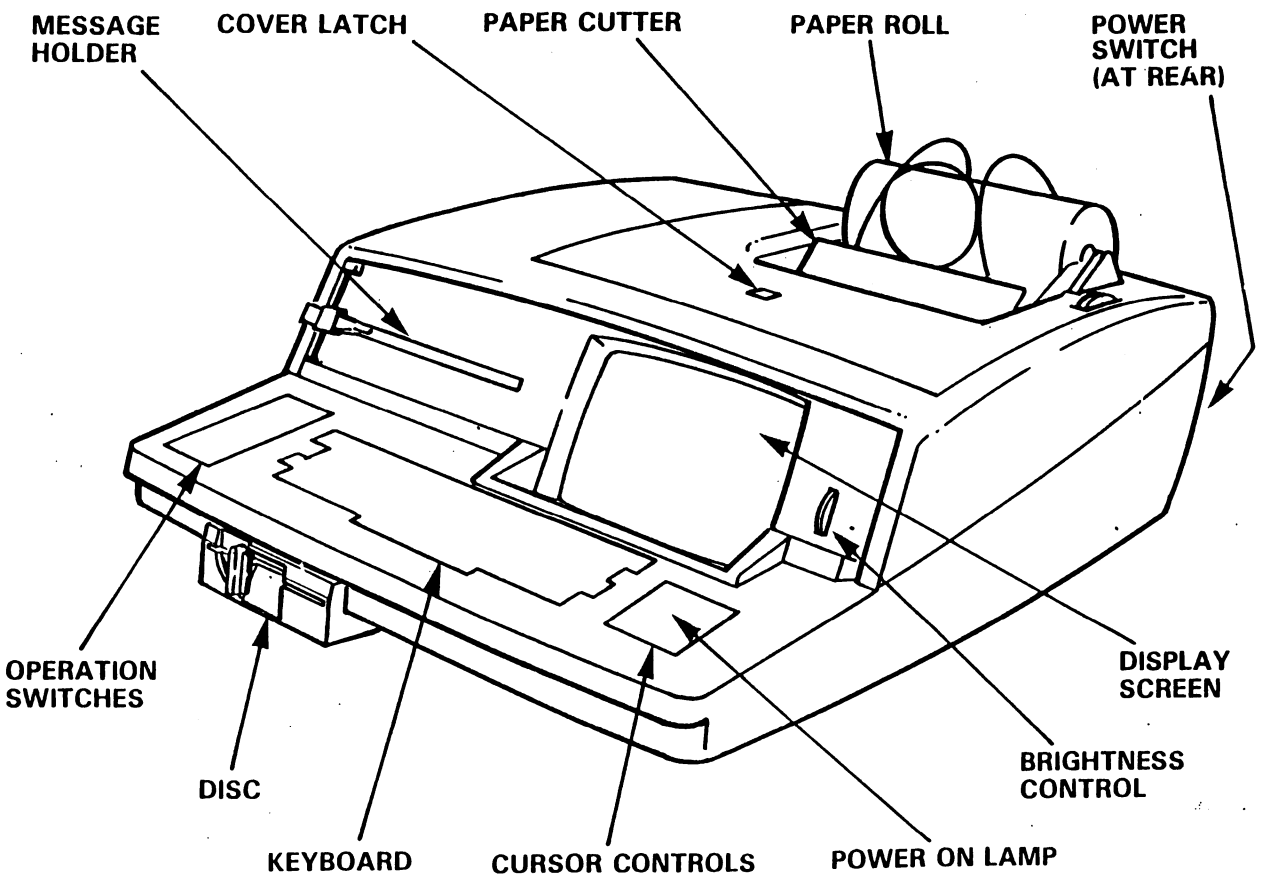
THE ELECTRONIC MEMORY

The electronic memory allows messages to be stored for subsequent transmission. Incoming calls may also be stored in the memory if required.

NOTE: A standby battery supply is included to protect the memory if a power failure occurs. However, the condition of the battery determines the duration of this protection. Maximum duration of protection with a fully charged battery is four days.

AUTOMATIC CALLING

This facility allows a call to be set up and transmitted automatically. The operator is able to prepare other messages during transmission.



ABBREVIATED NUMBERING

Up to 20 frequently called telex numbers may be stored in the memory and called by the operation of a single key on the keyboard. This facility saves time when preparing messages or calling the exchange. The call numbers entered in the memory may be changed by the operator as required.

MEMORY WILL STORE 20 CALL NUMBERS

AUTOMATIC RE-TRY AND DELAYED DELIVERY FACILITY

Messages may be prepared and stored in the memory for subsequent transmission at a specified time. The machine automatically re-tries the called numbers until transmission is effected.

MESSAGES MAY BE SENT WHILST THE OPERATOR IS OTHERWISE OCCUPIED OR ABSENT

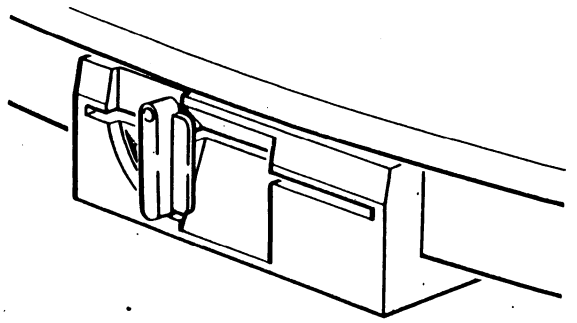
MULTI-ADDRESSING FACILITY

As an extension of the re-try facility, up to 20 addresses may be included on each message to be transmitted. The message may then be transmitted automatically to each address.

A MESSAGE MAY BE SENT TO SEVERAL ADDRESSES AUTOMATICALLY

DISC STORAGE OPTION

The Teleprinter may be equipped with an optional floppy disc storage facility. The disc extends the capacity of the memory and may be replaced when it is full. Full discs may be stored indefinitely or erased and used again.

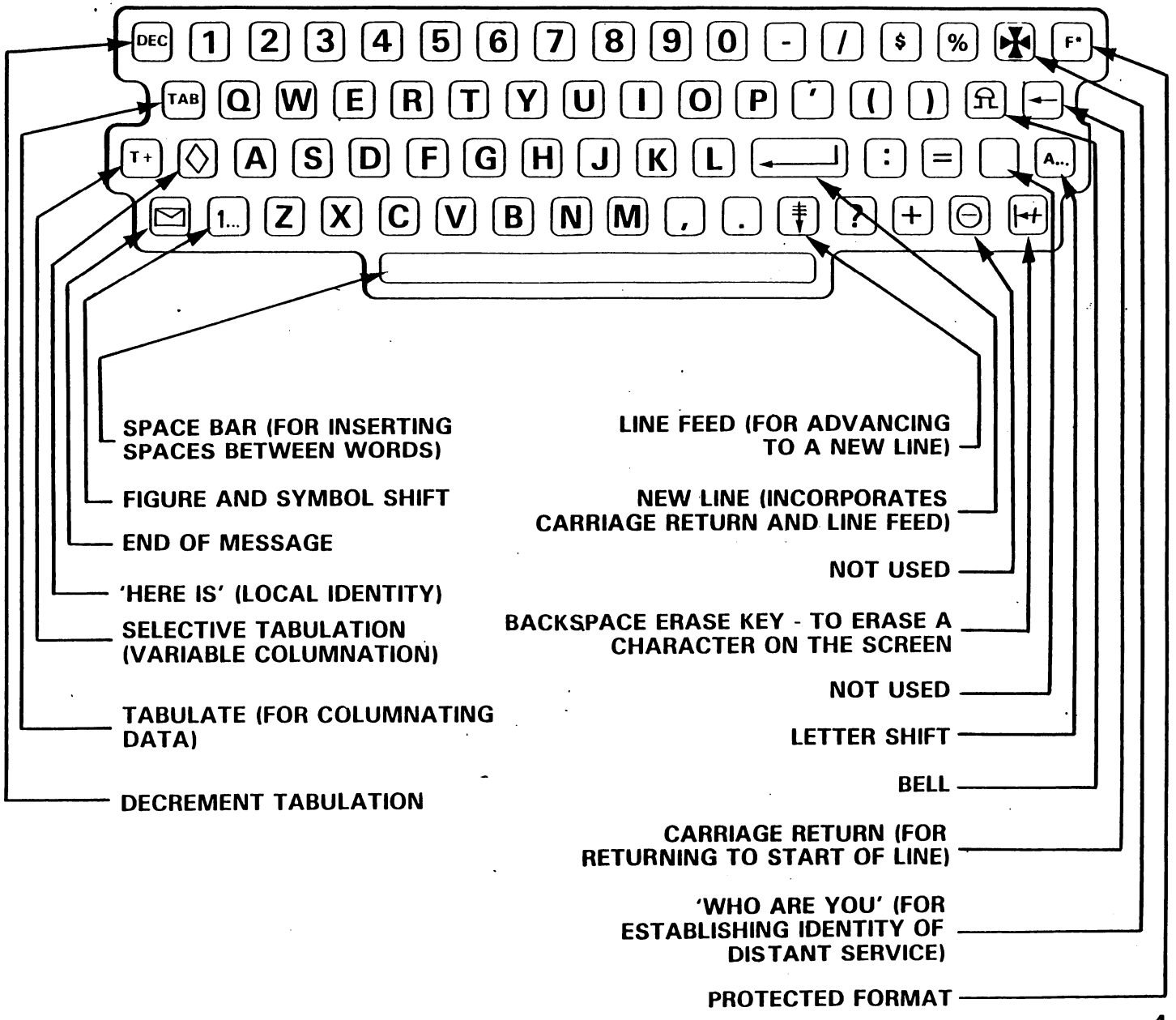


THE KEYBOARD

END OF LINE ALARM AND AUTOMATIC 'NEW LINE'

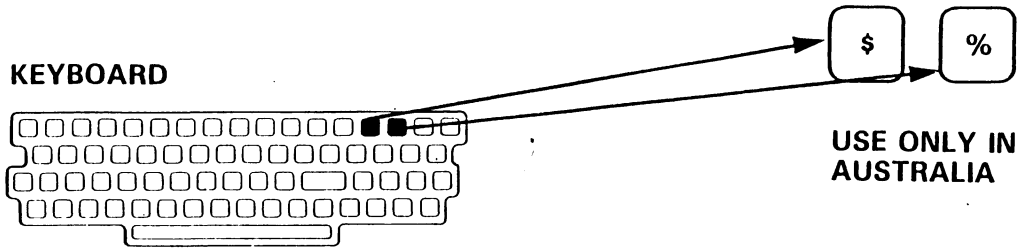
On direct keyboard transmission from the keyboard, an end of line alarm is heard approximately nine characters before the end of the line is reached. This allows adequate space to complete the word, and then operate the new-line key. If the new-line key is not operated, the carriage return and line feed function operates automatically; this could break up the last word on the line at an unsuitable point.

For preparation on the screen, operation of the new-line key at the end of a line is unnecessary.



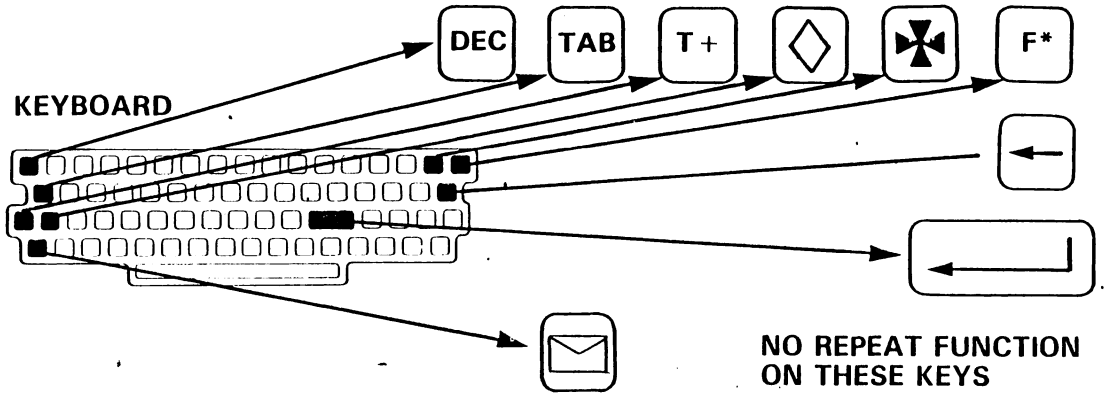
SPECIAL SYMBOLS

The $ and % keys on the keyboard are marked in red. To avoid possible confusion, these two keys should be used only when preparing messages for transmission within Australia.



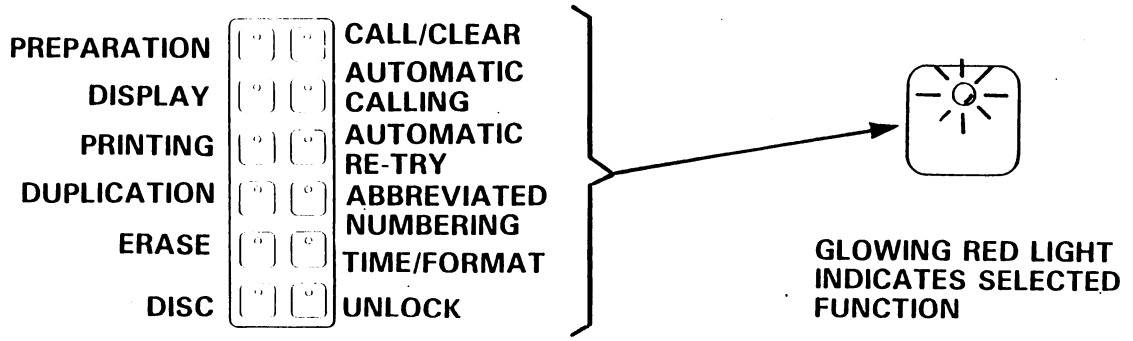
REPEAT CHARACTER OPERATION

Most keys, when held for more than one second repeat the character until the key is released. The repeat function does NOT operate on the keys illustrated at the right of this panel.



OPERATION SWITCHES

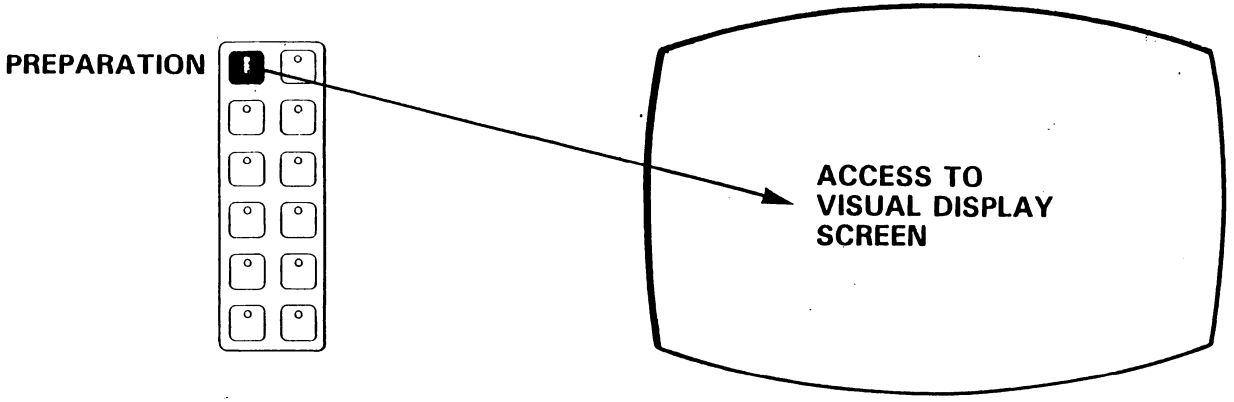
The operation switches are grouped together on a panel to the left of the keyboard. A glowing red light on the switch indicates that the function has been selected. If the lamp flashes, a message log number, identification number or other action is required (see Section 2).



PREPARATION SWITCH

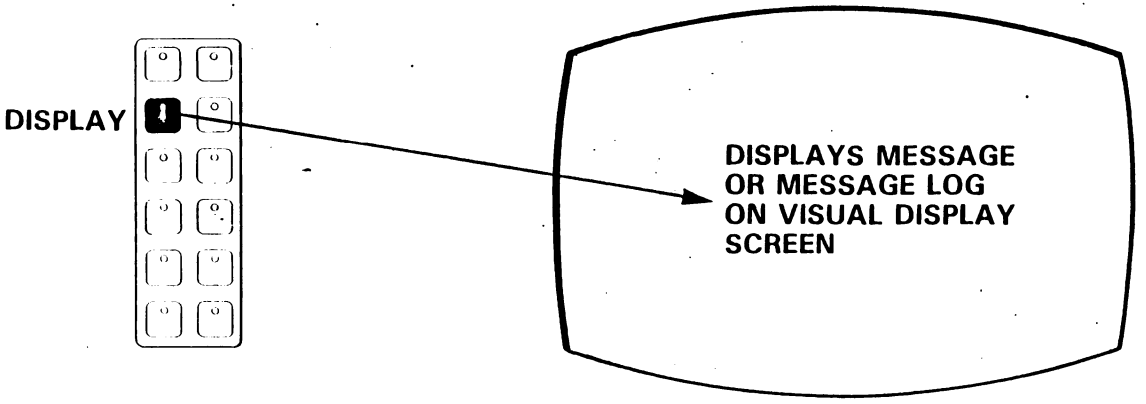
The PREPARATION switch gives access to the visual display screen to prepare a message.

Preparation of messages on the visual display screen may proceed whilst messages are being received or transmitted by the printer.



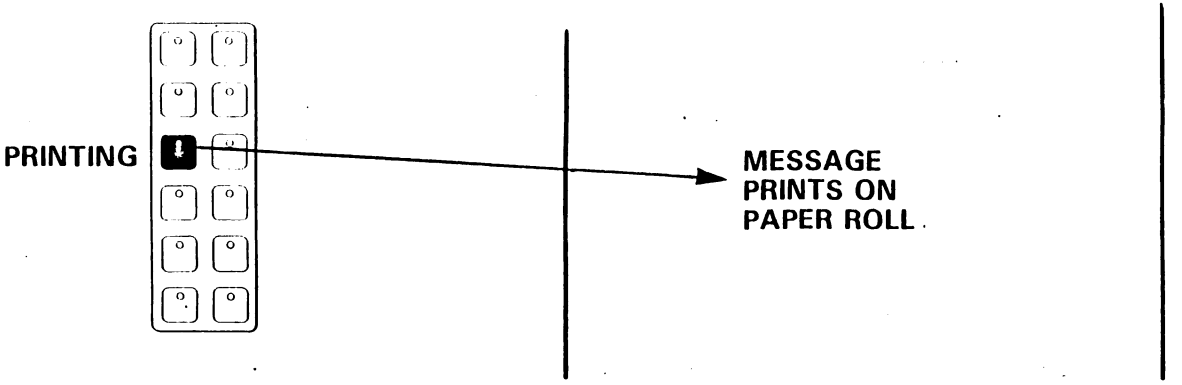
DISPLAY SWITCH

The DISPLAY switch causes a message or the contents of the message log to be displayed on the visual display screen.



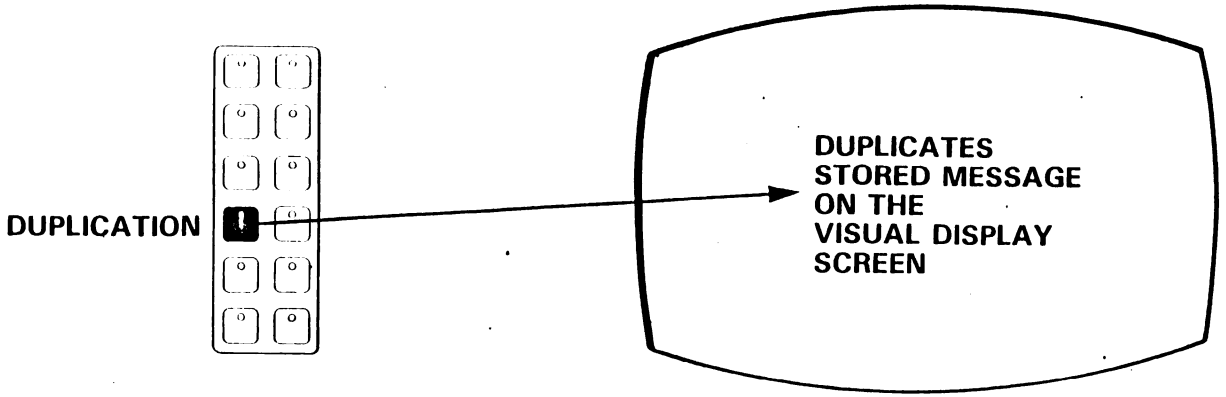
PRINTING SWITCH

The PRINTING switch causes a prepared or stored message to be printed on the paper roll (see Section 6).



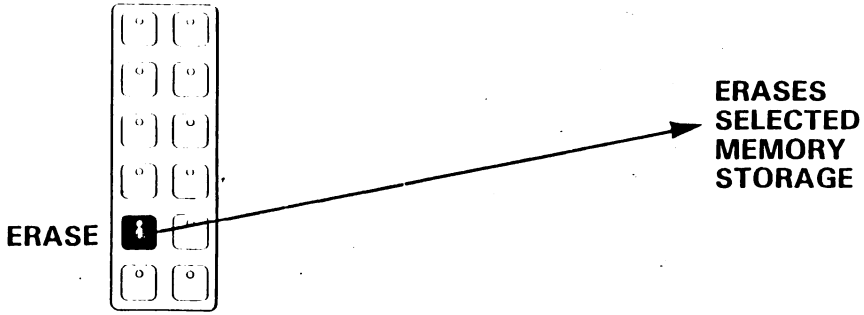
DUPLICATION SWITCH

The DUPLICATION switch allows a message stored in the memory to be duplicated on the visual display screen.



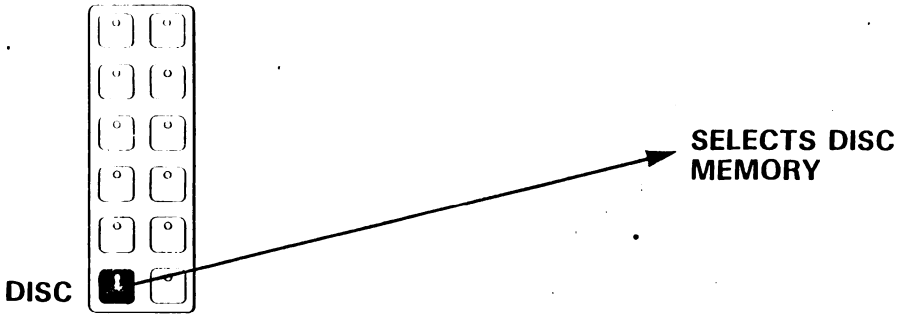
ERASE SWITCH

The ERASE switch may be used to erase a single message, groups of messages or the abbreviated number storage (see Section 6).



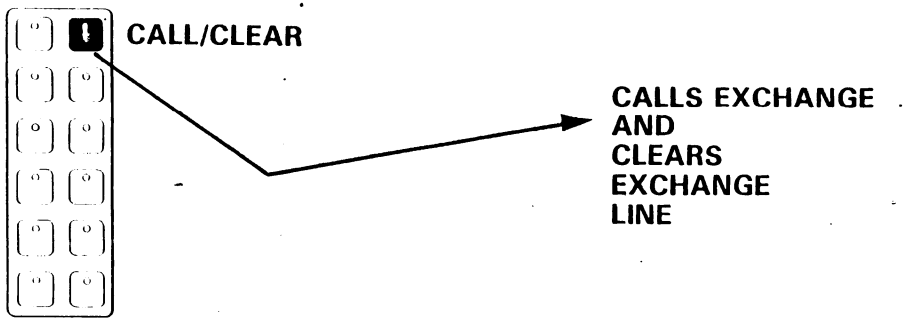
DISC SWITCH

When the disc option is fitted to the teleprinter the DISC SWITCH gives access to the disc memory.



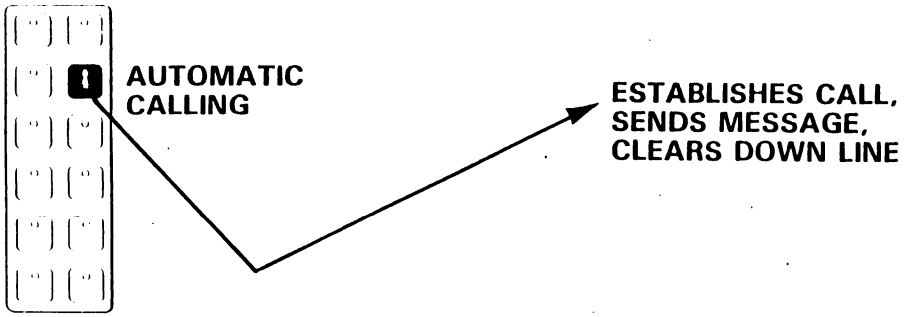
CALL/CLEAR SWITCH

The CALL/CLEAR switch calls the exchange at the start of a manual call and clears DOWN the exchange line after manual transmission of a message.



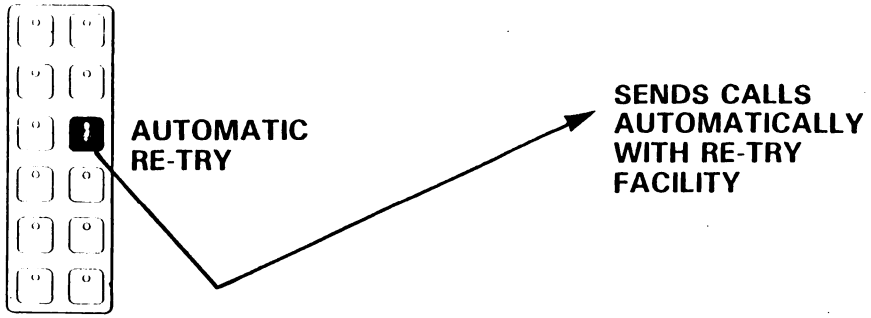
AUTOMATIC CALLING SWITCH

When used in conjunction with a Message Identification Number, the AUTOMATIC CALLING switch automatically establishes a call, transmits a message and then clears down the exchange line.



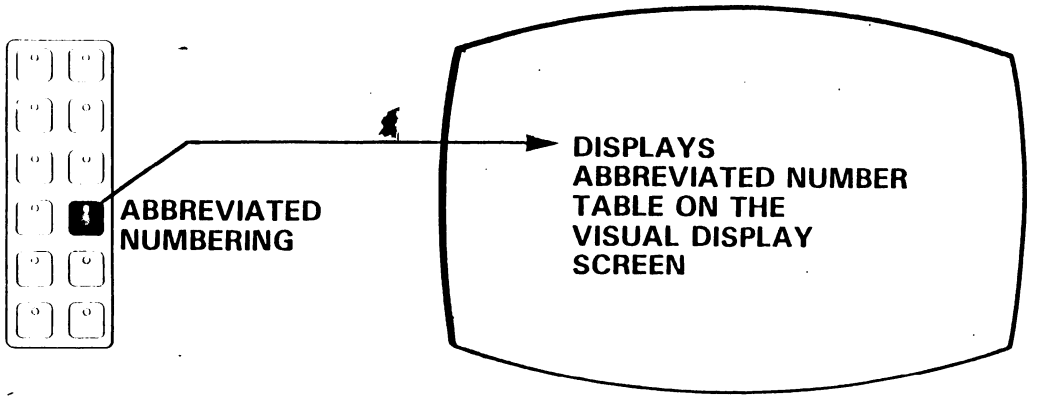
AUTOMATIC RE-TRY SWITCH

The AUTOMATIC RE-TRY switch selects the automatic transmission mode with re-try on unsuccessful calls.



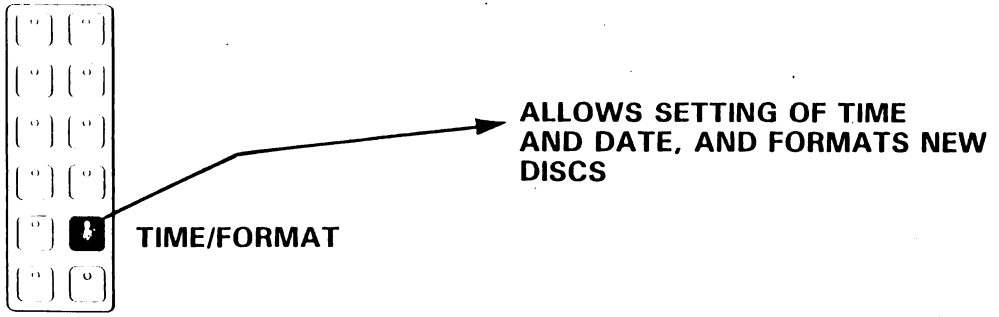
ABBREVIATED NUMBERING SWITCH

The ABBREVIATED NUMBERING switch displays the abbreviated number table on the visual display screen.



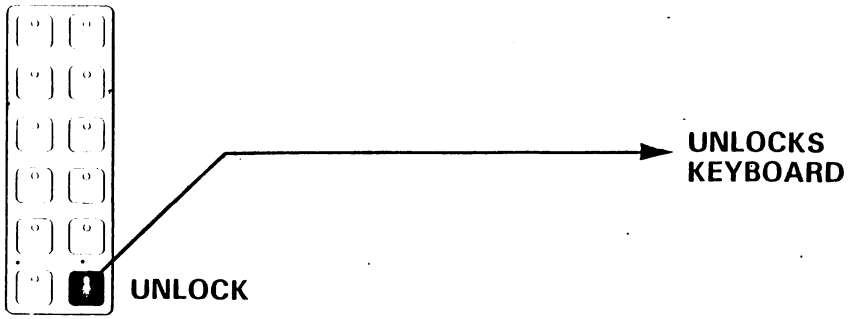
TIME/FORMAT SWITCH

The TIME/FORMAT switch allows the current time and date to be set on the visual display screen, or allows a new disc to be formatted.



UNLOCK SWITCH

The UNLOCK switch unlocks the keyboard and re-sets the audible alarm. This switch may also be used to erase a service message.

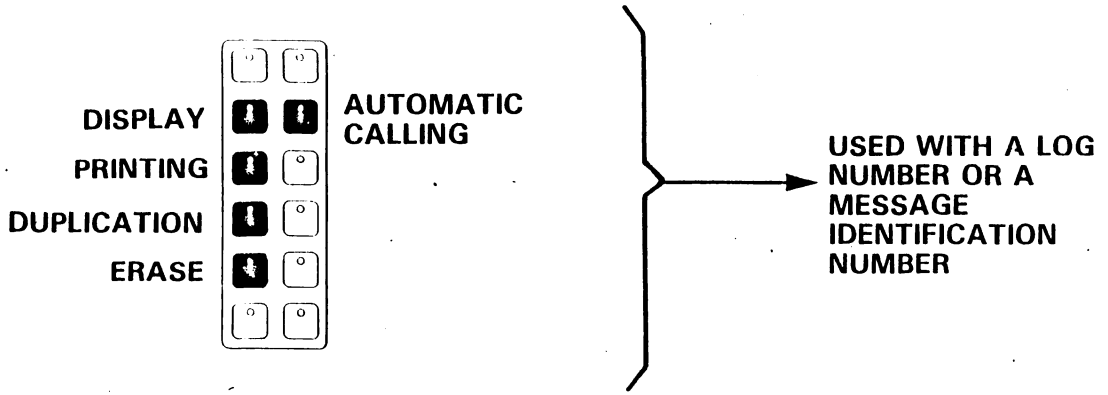


OPERATION SWITCHES

NOTE: Normally, the DISPLAY, DUPLICATION and ERASE switches are used in conjunction with a log identification number.

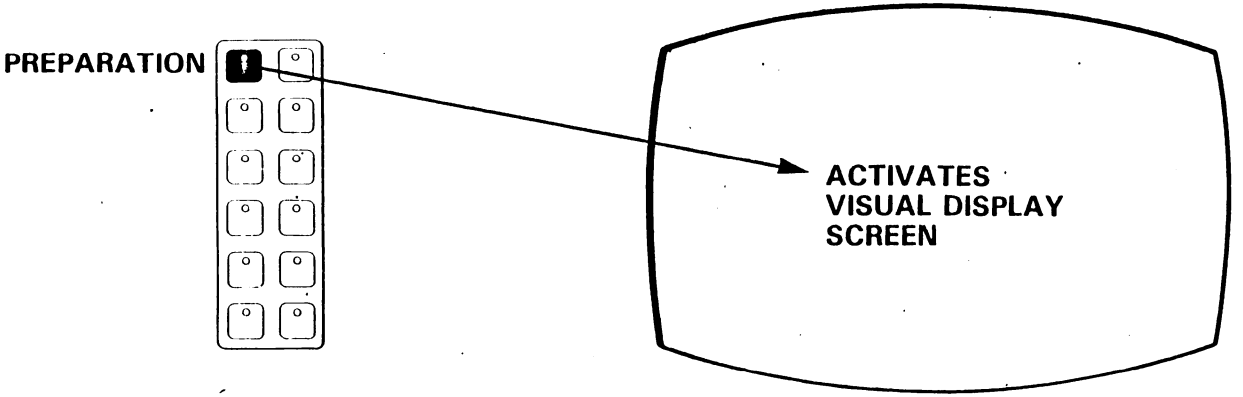
AUTOMATIC CALLING is used with a message identification number.

PRINTING may be used with a log number for local printing or a message identification number if the message is to be sent to an exchange line.



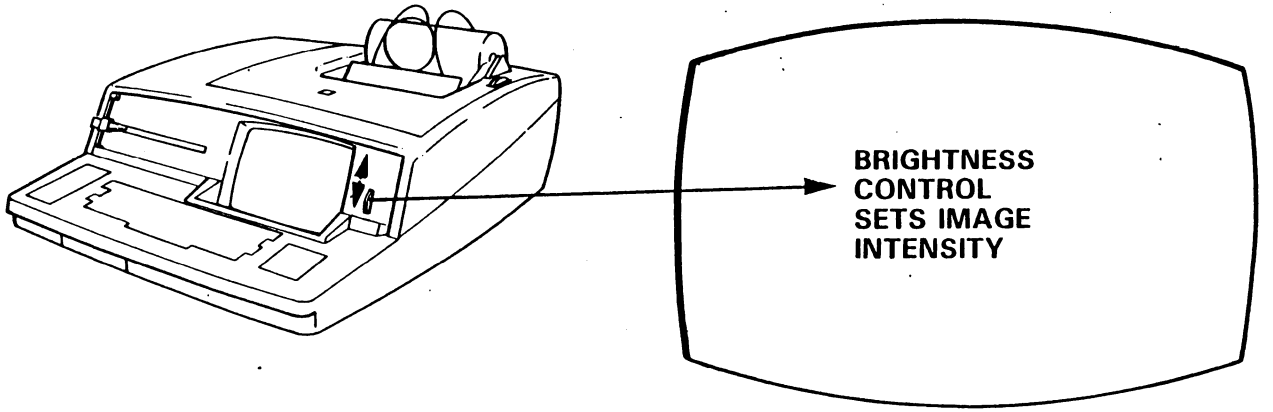
THE DISPLAY SCREEN

The visual display screen may be used to display prepared messages, stored messages and the abbreviated numbering table. When the teleprinter is in standby, the screen image fades. To activate the screen again, press the PREPARATION switch.



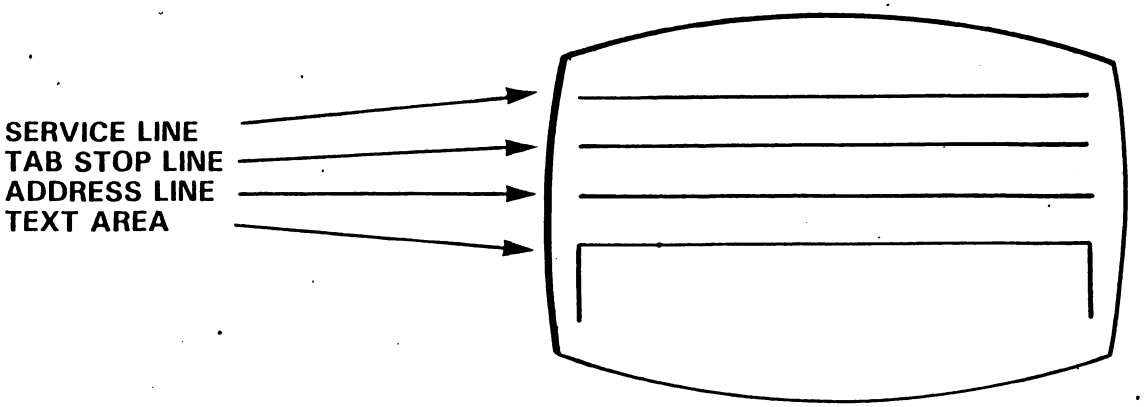
BRIGHTNESS CONTROL

Turn the brightness control to set the visual display at the desired intensity.

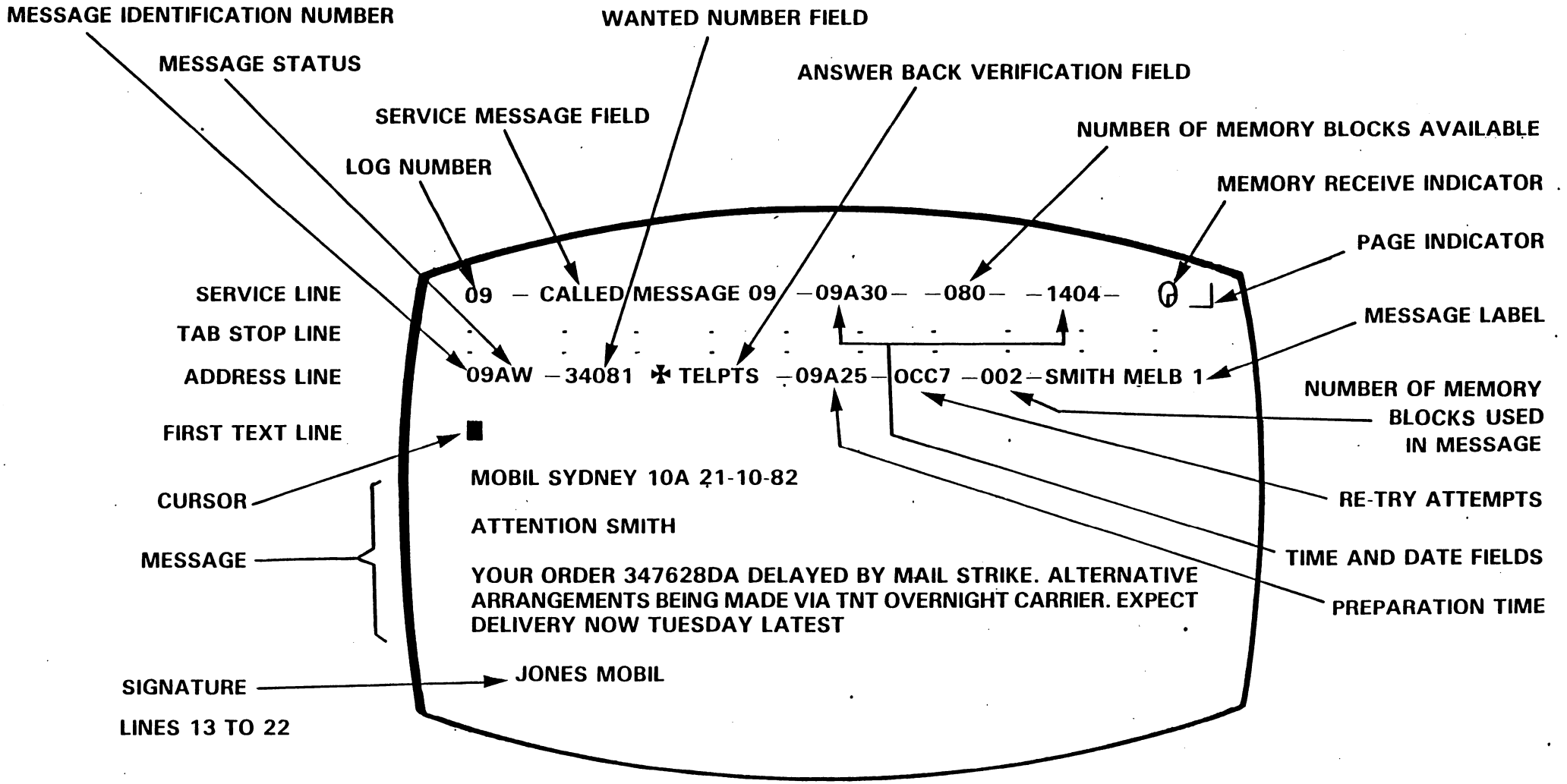


DISPLAY AREAS

The visual display screen is divided into four areas. These areas are explained in the following pages.



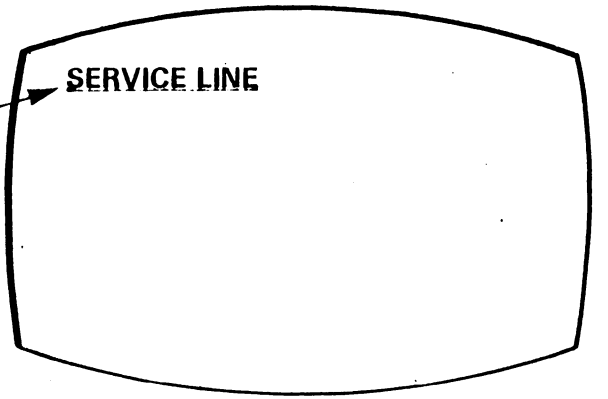
DISPLAY AREAS



SERVICE LINE

The first line on the visual display screen is the service line. The information displayed in this line is entered automatically by the teleprinter. The service line shows:

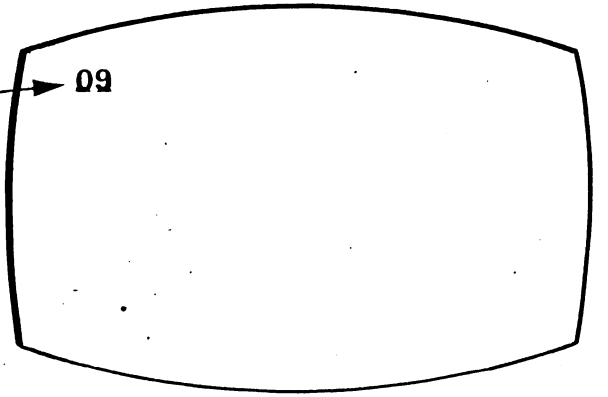
LOG NUMBERS
SERVICES MESSAGES
TIME AND DATE
MEMORY BLOCKS AVAILABLE
MEMORY RECEIVE INDICATOR
PAGE INDICATOR



LOG NUMBERS

The first two characters in the service line represent the log number of the message as it will be recorded in the memory. The log number is used in conjunction with the operation switches to DISPLAY, PRINT, DUPLICATE or ERASE messages locally on the teleprinter.

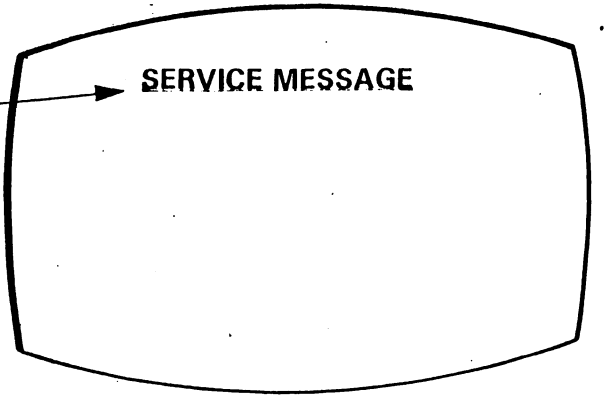
LOG NUMBER DISPLAY



SERVICE MESSAGES

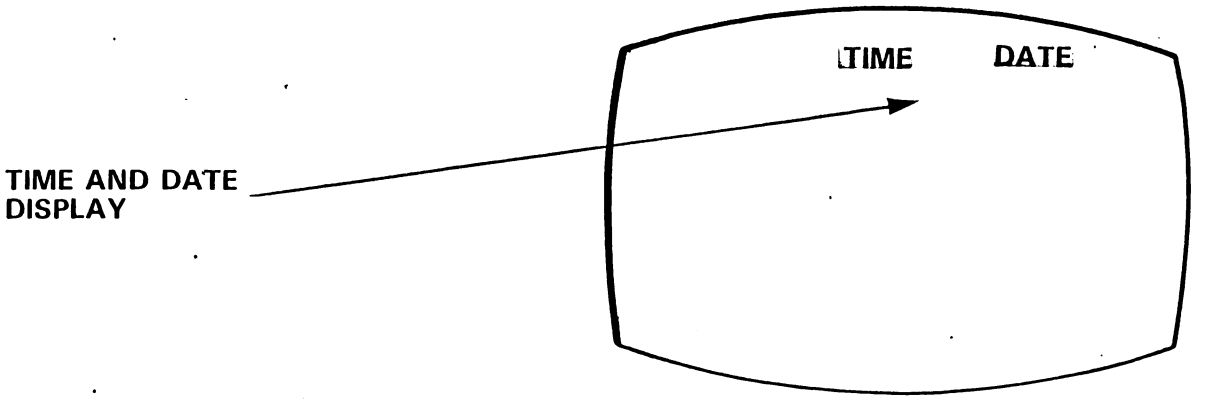
Service messages appear in the space following the log number to indicate modes of operation or faults (see Section 4).

SERVICE MESSAGE DISPLAY



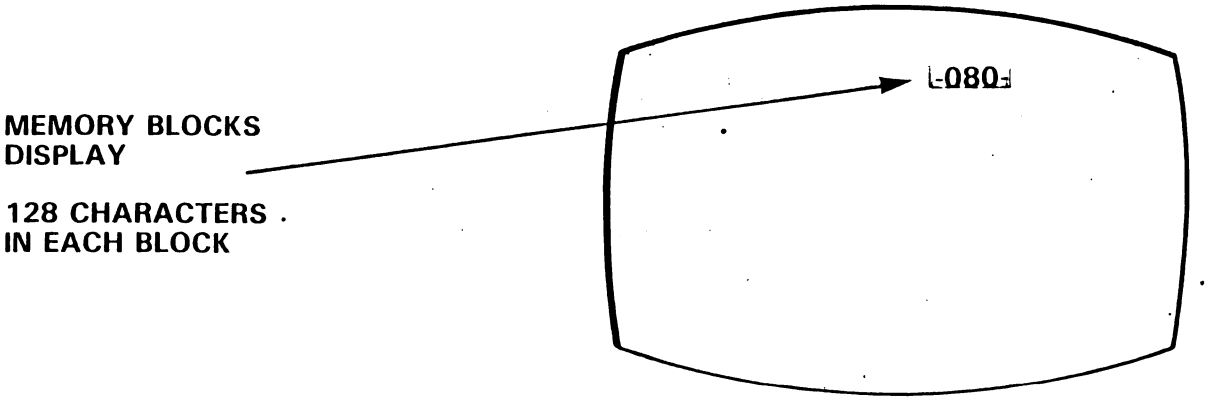
TIME AND DATE

Time and date information appears when the teleprinter is fitted with the re-try function (see Section 3).



MEMORY BLOCKS AVAILABLE

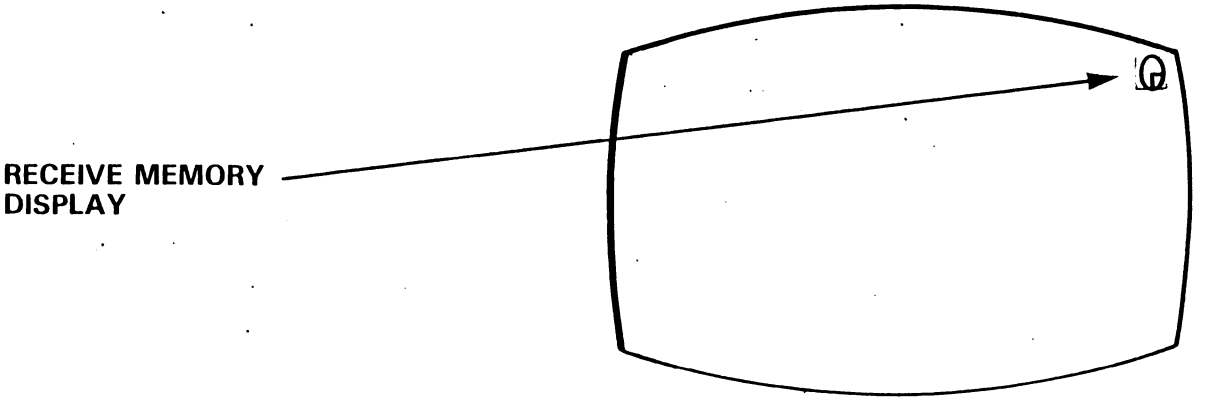
This display indicates the number of memory blocks still available for use. The memory has 232 memory blocks, and each memory block contains 128 characters. When the number of blocks available equals 000, MEMORY FULL is displayed on the visual display screen. Erase unwanted messages before preparing further messages (see Section 6).



RECEIVE MEMORY INDICATOR

Incoming calls may be routed to the memory in addition to being printed automatically (see Section 6).

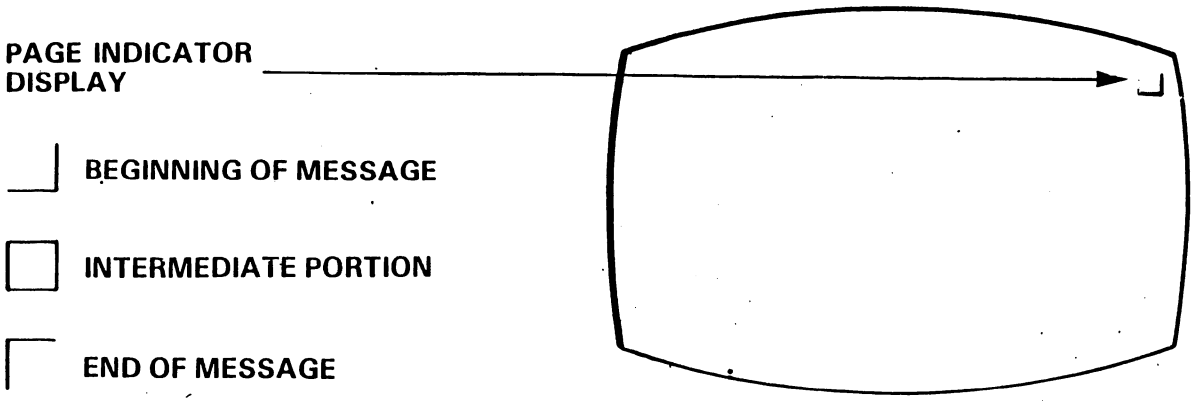
When set in this mode, the teleprinter displays the character Ⓡ in this space.



PAGE INDICATOR

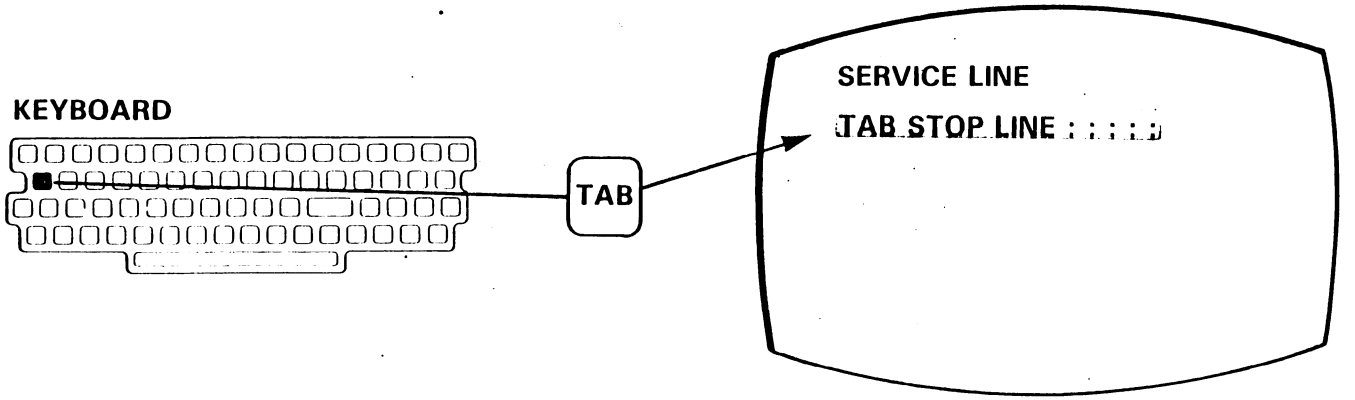
When a long message containing more than 22 lines is being displayed the whole message may be moved up or down the screen by operation of the cursor keys and .

The page indicator shows what portion of the message is being displayed.



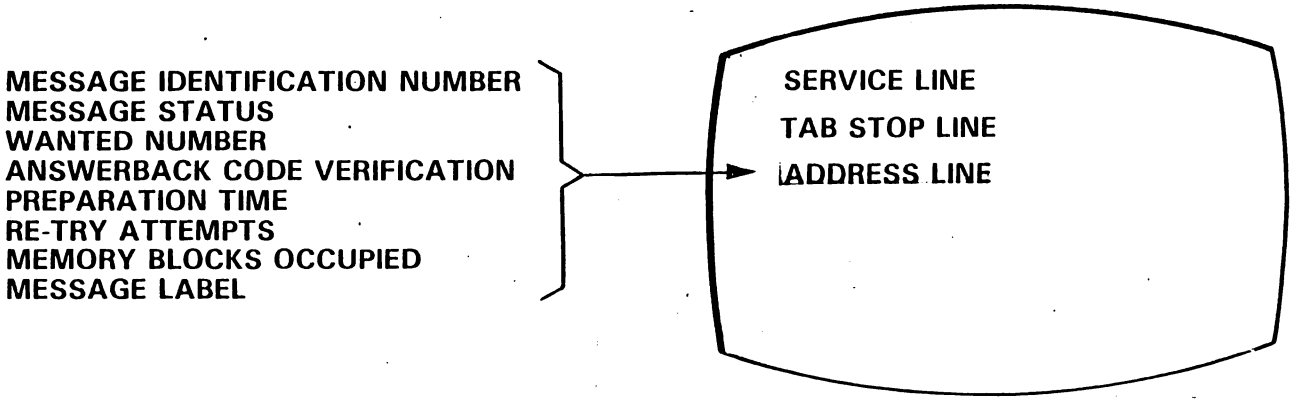
TAB STOP LINE

The tab stop line may be set up for tabulation of parts of messages in a manner similar to typewriter tabulation (see Section 6).



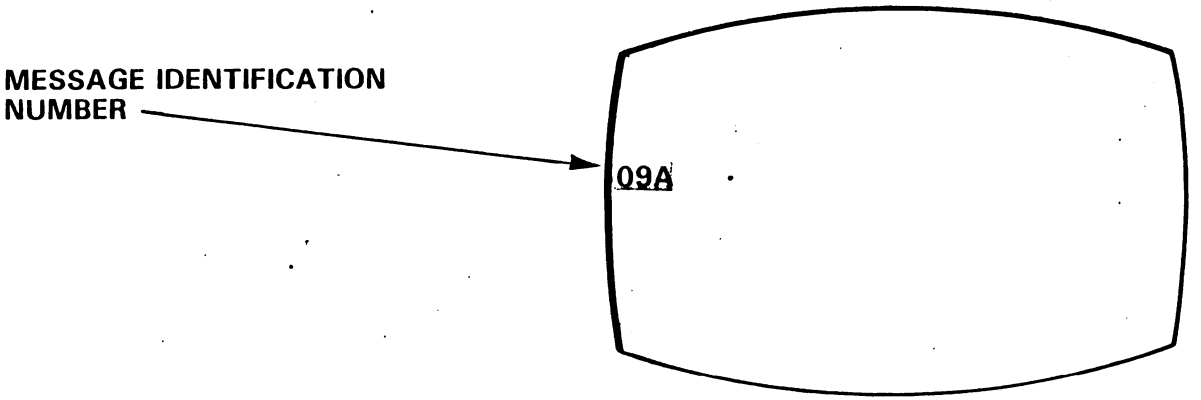
ADDRESS LINE

The third line on the visual display screen is the address line. The following information may be displayed on the address line in the appropriate spaces or fields:



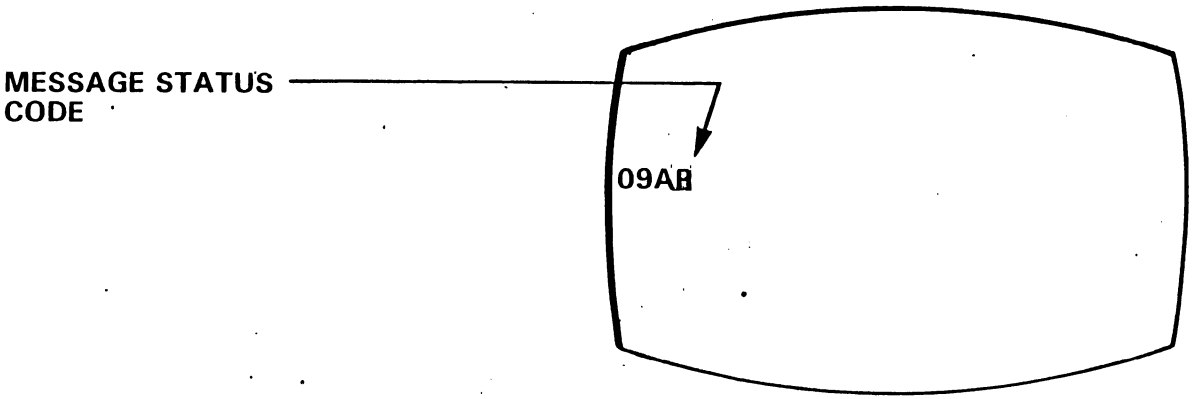
MESSAGE IDENTIFICATION NUMBER

The first three characters displayed on the address line indicate the message identification number of the message as it will be recorded in the memory. The third character is the address line indicator which will always be 'A' except in multi-address messages. These characters must be used when transmitting a message from the memory.



MESSAGE STATUS

A fourth character is also displayed in association with the message identification number. This fourth character indicates the status of the message as defined by the message status code.

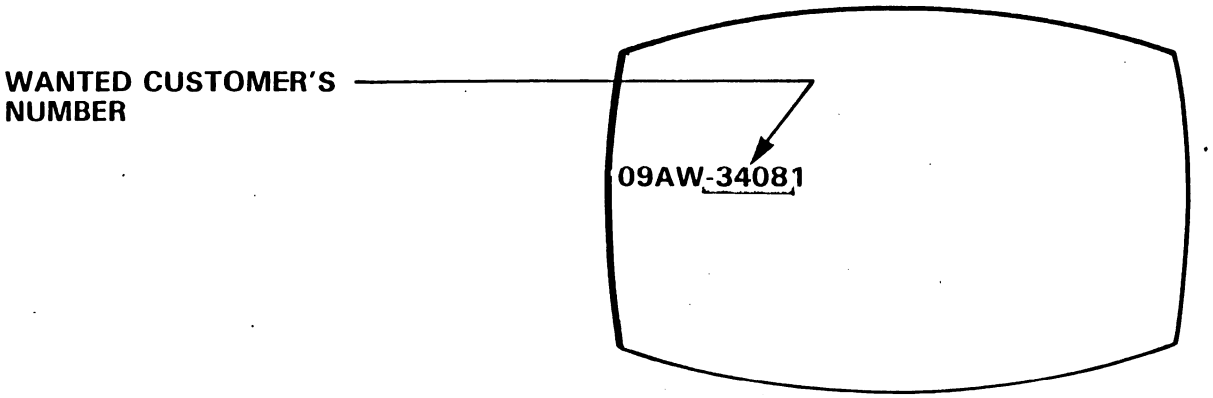


MESSAGE STATUS CODE

P = PREPARED — A message without a wanted customer number.
W = WAITING — A message with a wanted customer number which has yet to be transmitted.
S = SENT — A message which has been transmitted.
R = RECEIVED — A message which has been received and stored in the memory.
J = REJECTED — A message which has failed to be transmitted.
F = FORMAT — A message with a protected format, see Section 6.

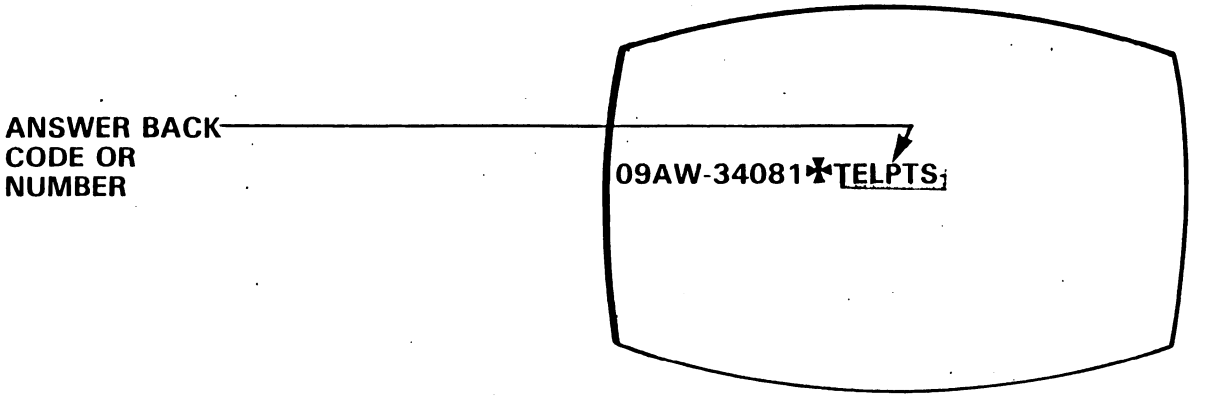
WANTED CUSTOMER'S NUMBER

Before a message may be transmitted automatically, you must enter the wanted customer's number in the address line. The number may be typed in full or, if it is entered in the abbreviated number table, typed as a single letter indicator for the required number; it will be entered in full on the address line.



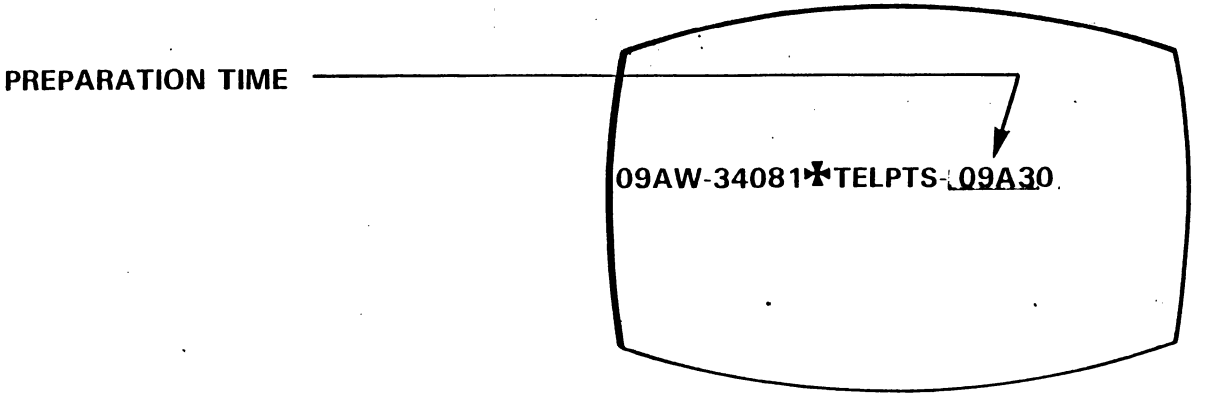
ANSWERBACK VERIFICATION

After the wanted customer's number is entered in the address line, the answerback codeword or number of the wanted customer may be entered. The teleprinter then autcmatically checks concurrence between the called number and the answerback code. If a disparity occurs, the call is automatically cleared down without charge.



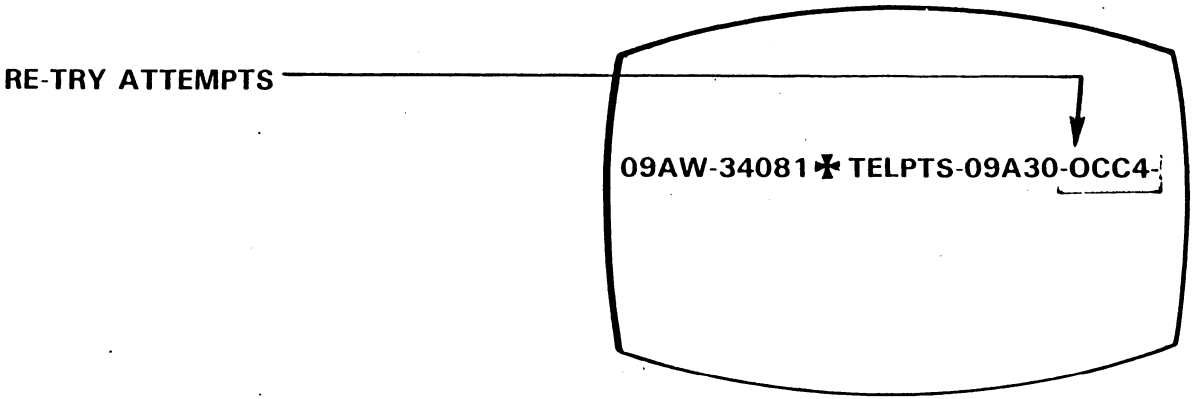
PREPARATION TIME

The current time will be displayed in this field when the PREPARATION switch is operated. The re-try facility will use this time to initiate transmission of the message. If delayed delivery is required, the time shown in this field should be altered to the time at which transmission is actually required.



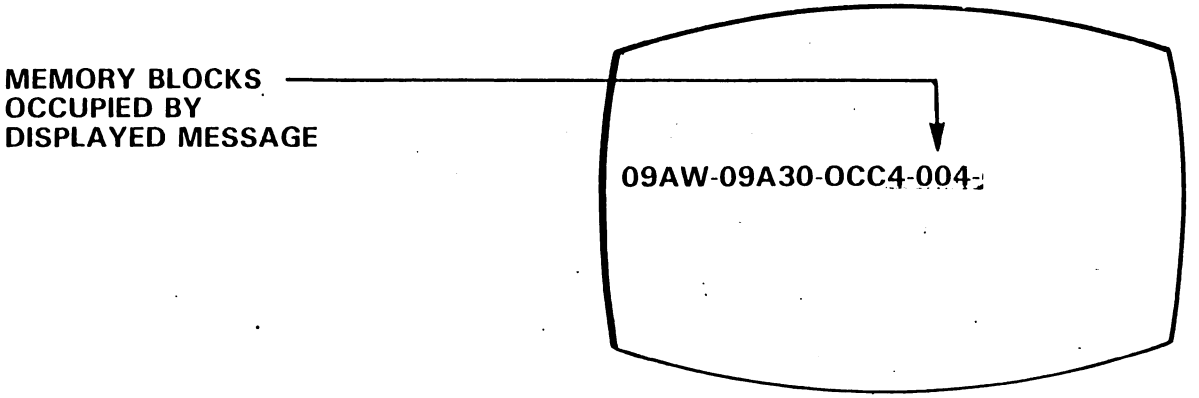
RE-TRY ATTEMPTS

This field will display the result of unsuccessful call attempts and indicate the number of re-tries remaining.



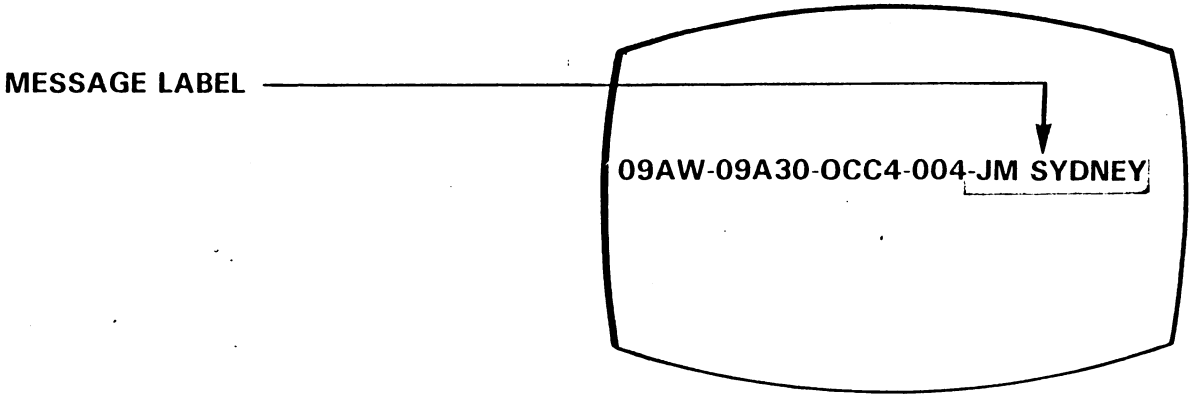
NUMBER OF MEMORY BLOCKS OCCUPIED

A three-digit display in the field after the answerback code verification field in the address line indicates the number of memory blocks occupied by the message displayed on the visual display screen.



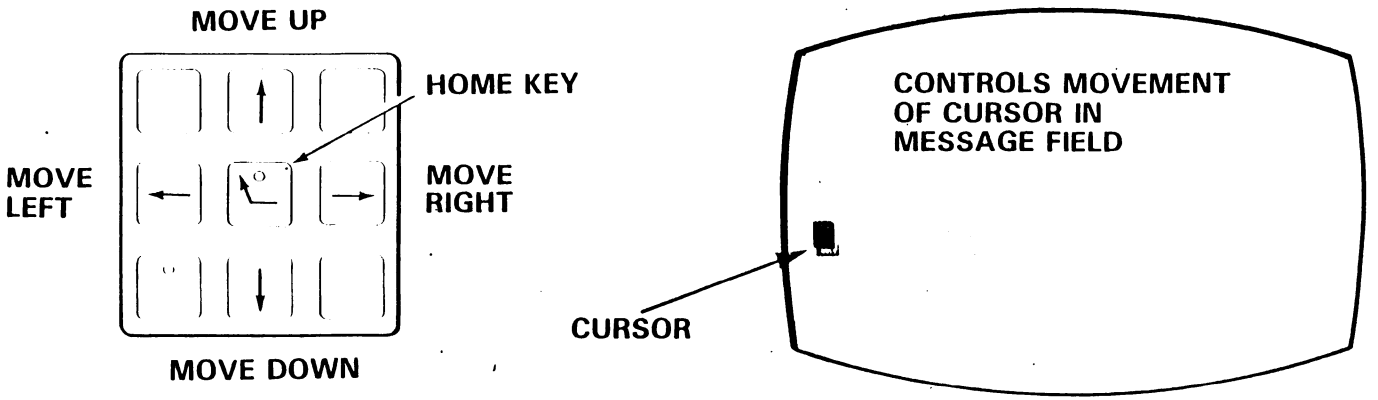
MESSAGE LABEL

In the field after the memory block display in the address line, a label may be entered to help identify a particular message. Fourteen characters are available for this label. The label is stored in the memory with the message but is not transmitted.



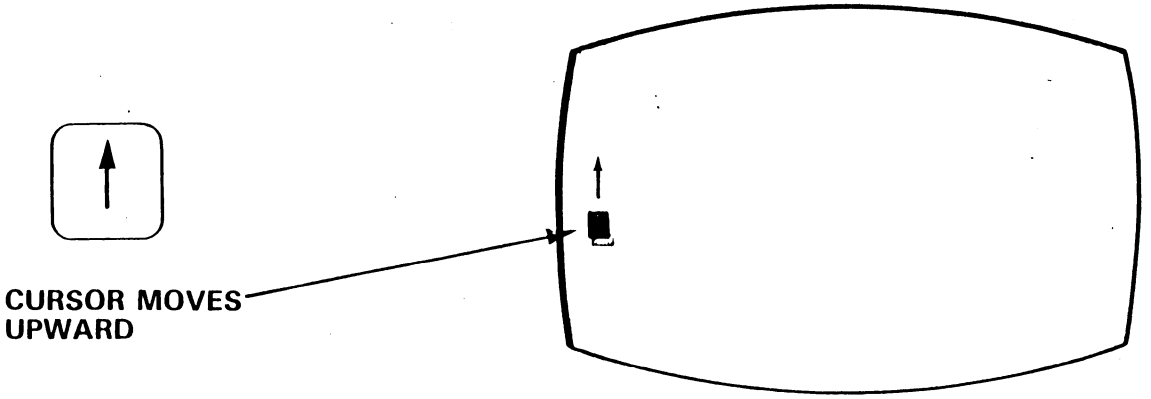
CURSOR CONTROLS

The cursor is a small solid block on the display screen. The cursor shows where the next character will be entered in the display by operation of the keyboard. The cursor controls allow the cursor to be moved around on the visual display screen.



THE MOVE UP KEY

When this key is pressed, the cursor moves up one line. When the key is held down, the cursor continues to move upwards until the top line of the message area is reached.

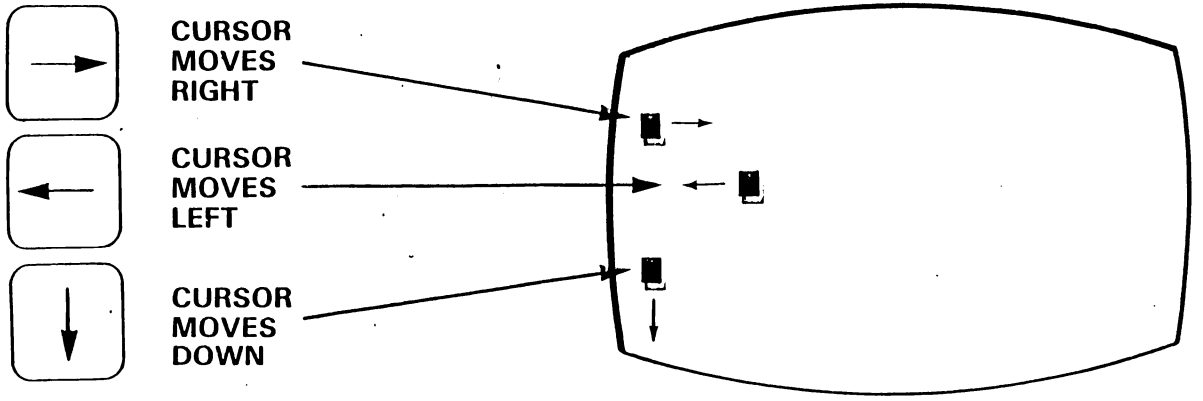


THE MOVE RIGHT KEY

THE MOVE LEFT KEY

THE MOVE DOWN KEY

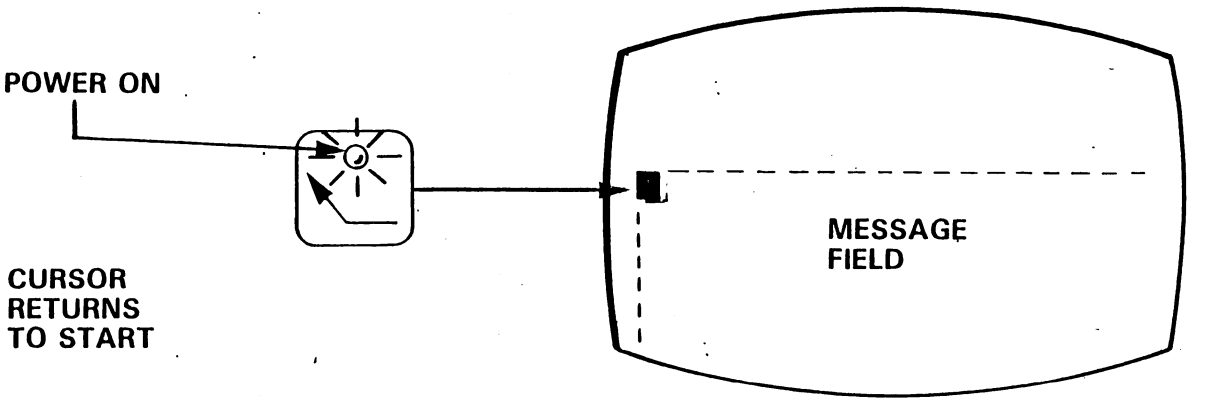
Hold the keys and the cursor keeps moving.



HOME KEY

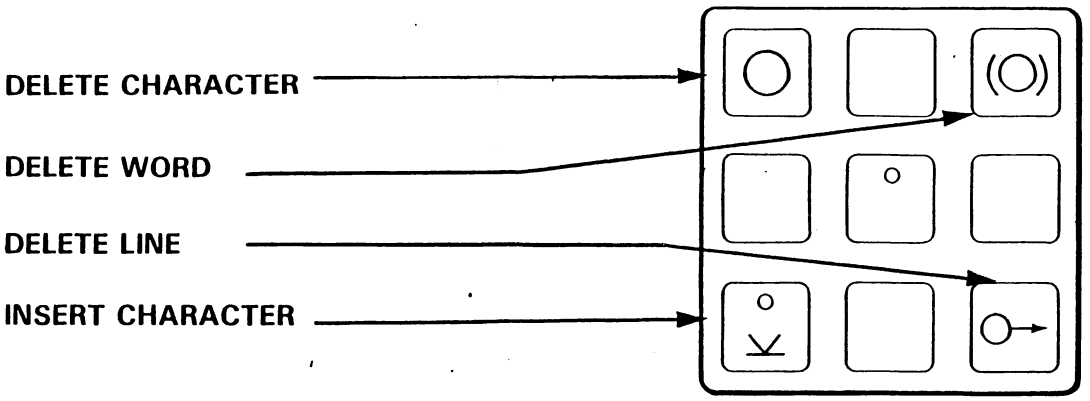
Press this key and the cursor returns to the beginning of the message field.

NOTE: This key also includes a power on lamp which indicates that the teleprinter is connected to the power.



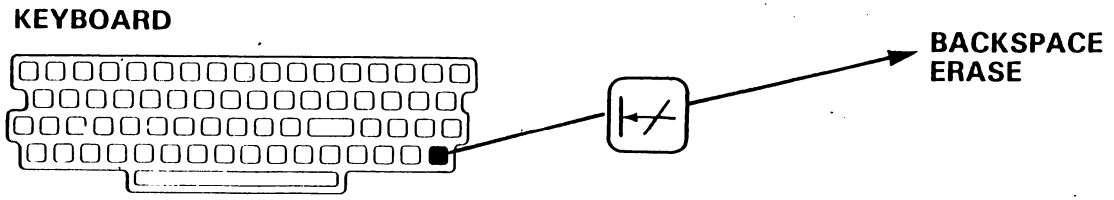
EDIT KEYS

These keys permit editing of a message during preparation. (See section 2).



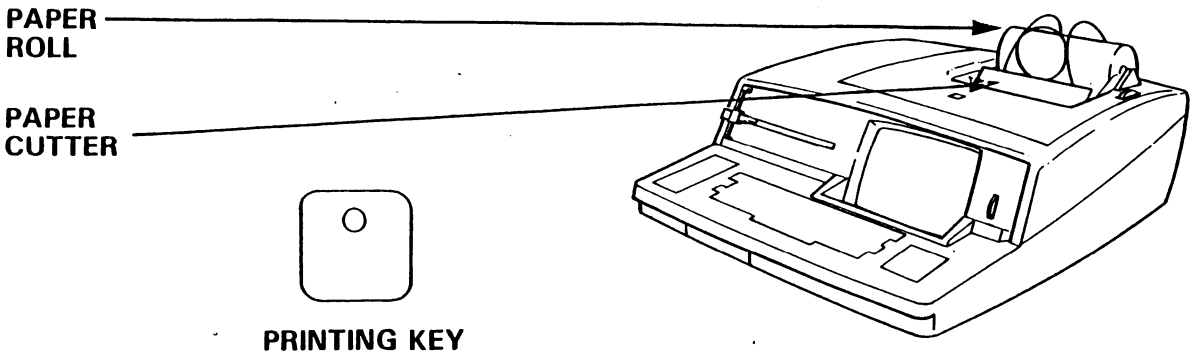
BACKSPACE ERASE KEY

This key may also be used for editing. (See section 2).



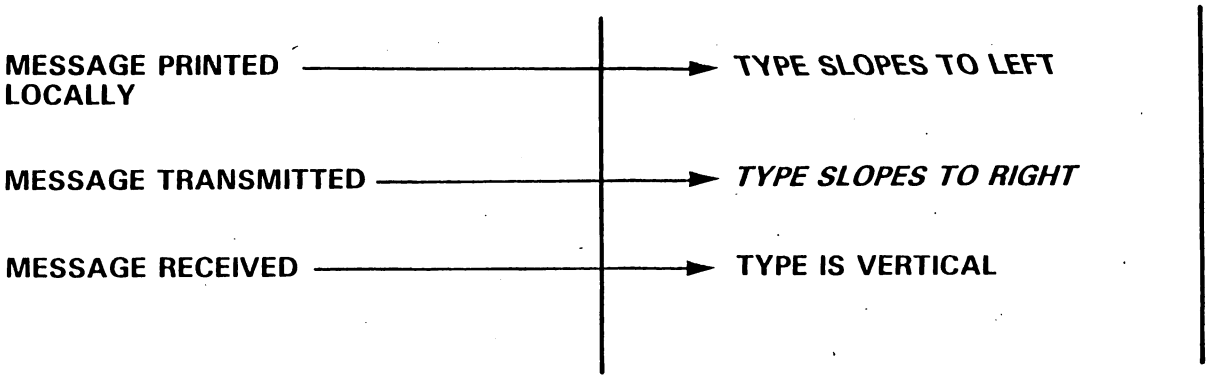
THE PRINTER

The printer automatically provides a printed copy of all incoming and outgoing messages on the paper roll. Operation of the PRINTING key causes any message displayed on the visual display screen to be printed on the paper roll.



PAGE COPY IDENTIFICATION

The printer is capable of printing in three type styles. Type slanting to the left indicates a message which has been printed locally. Type slanting to the right indicates a message which has been transmitted. Vertical type indicates a message which has been received.

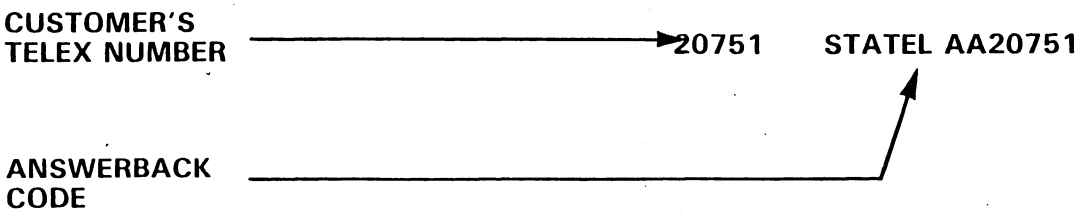


CHANGING PAPER ROLLS AND PRINTING RIBBONS

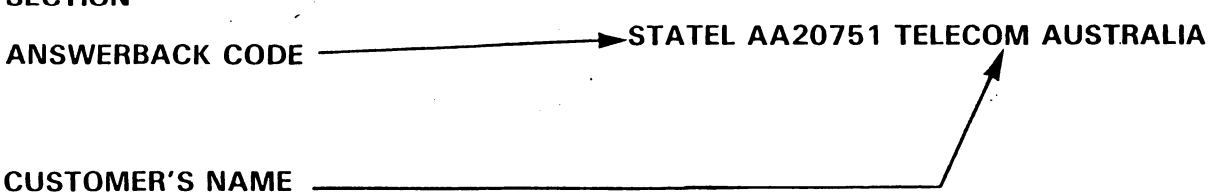
See Section 9.

THE TELEX DIRECTORY

The telex directory is divided into two sections. The first section contains an alphabetical listing of customers with details of their Telex numbers and answerback codes.



The second section of the telex directory contains an alphabetical listing of answerback codes with the associated customer's name. Use this section to identify callers.



If the information you require is not in the Telex directory, call the Service Centre for assistance.

ASK FOR
ASSISTANCE
CALL TELEX 011

SERVICE CODES

If a call is unsuccessful, a service code is printed on the paper roll.

On receipt of one of these codes the teleprinter clears down automatically. The table on this page details the codes, their meaning and the action to be taken.

If the teleprinter is operating in the RE-TRY mode, the printed line log will indicate the reason for disconnection (RFD Code). See Section 2.

SERVICE CODE	WHAT IT MEANS	WHAT YOU SHOULD DO
NC	No circuit or equipment available at the moment.	Call again shortly.
OCC	The called number is occupied (engaged).	Call again shortly.
DER	The called number is out of order or temporarily out of service.	Call again shortly. If the code persists, call the Service Centre.
ABS	Customer is absent. Office is closed.	Call the Service Centre for details.
NA	Access to called number is not admitted.	Check that you have the correct number. If so, call the Service Centre.
NP	The called number is not a working line.	Check number. Call Service Centre.

DIFFICULTIES AND FAULTS

If mutilations or other difficulties occur on a call which you have originated, clear down the call. This stops the charging meter. Report the details to the Service Centre. The general rule is that the person making the call reports any difficulties but, on occasions, only the receiver knows that the message is faulty. The receiver should then report the details to the Service Centre. If the teleprinter cannot be used, report the difficulty by telephone. The number to call is listed in the information pages of the Telex Directory.

Special procedures are used for reporting faults on international calls (see Section 8).

REBATES

Charges for faulty calls that you originate may be rebated. Check the answerback to ensure the correct number has been obtained. Keep a copy of any mutilated message and report the difficulty either to the national (011) or international service (0145+) as appropriate.

This section describes how to check whether the teleprinter is ready to send or receive messages.

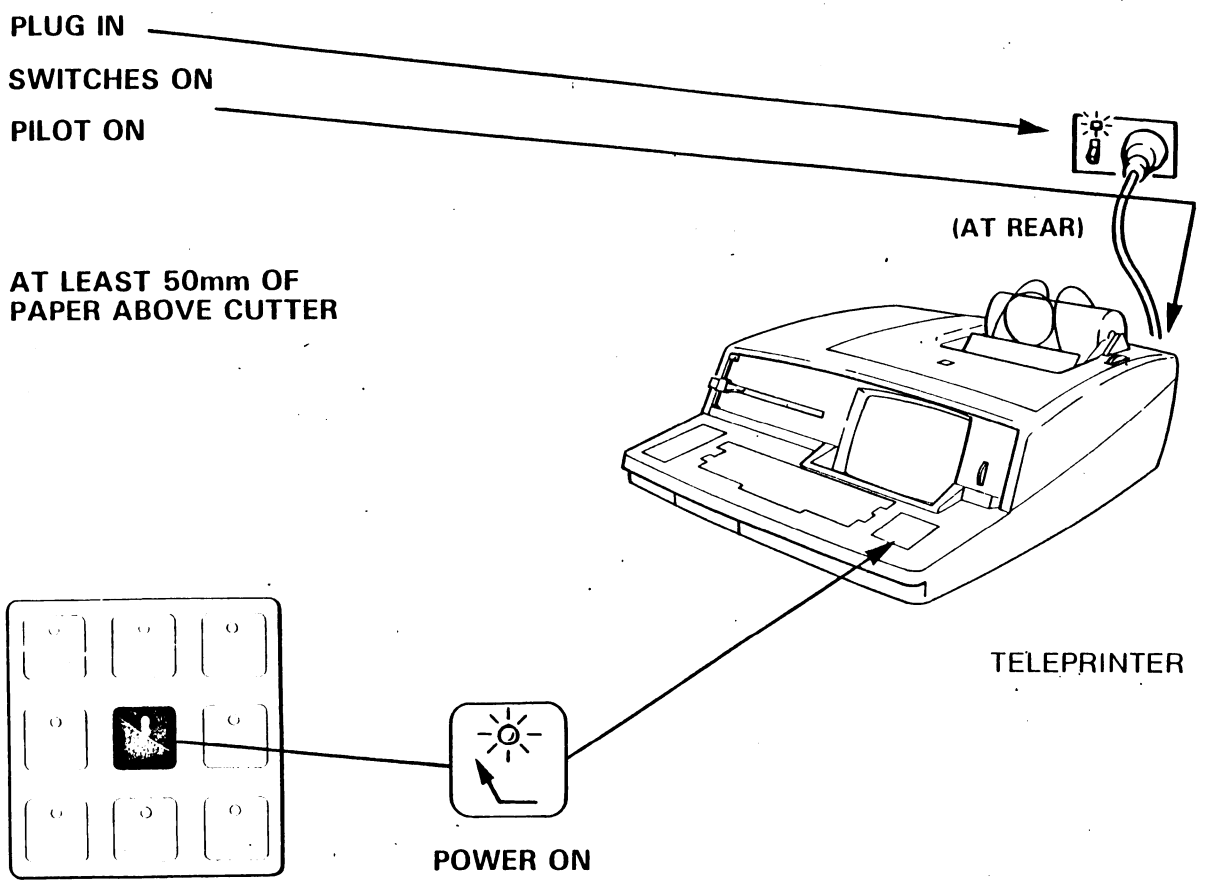
1. Is the power on?

2. Is there enough paper in the machine?

3. Is the paper protruding above the cutting edge?

4. Is the teleprinter power on lamp glowing?

LEAVE THE MACHINE TURNED ON AT ALL TIMES.

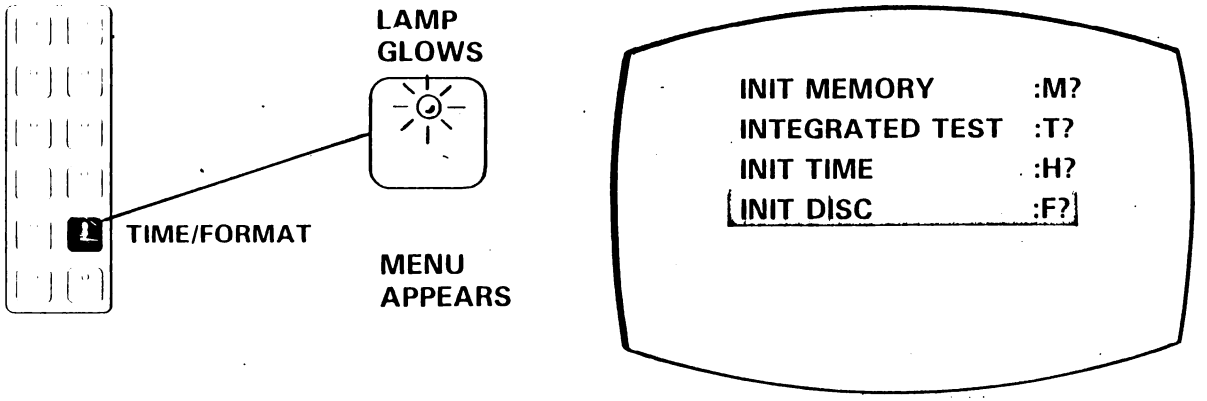


**ANY DOUBTS OR PROBLEMS?
CALL THE SERVICE CENTRE**

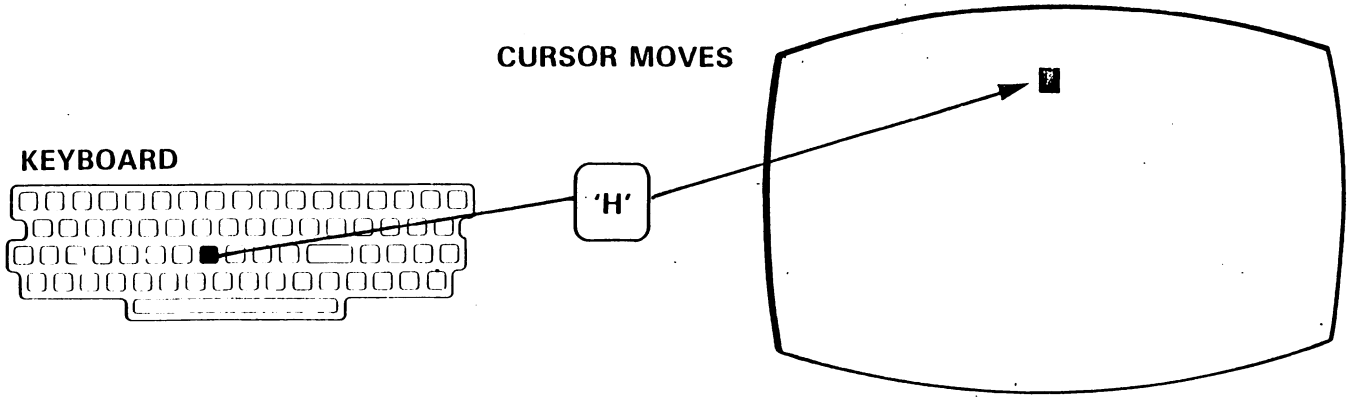
SETTING TIME AND DATE

If the teleprinter is fitted with the RE-TRY facility, it may be necessary to set or reset the current time or date display on the service line of the visual display screen. To set the time and date:

1. Press the TIME/FORMAT switch. There will be a short pause followed by display of a menu.



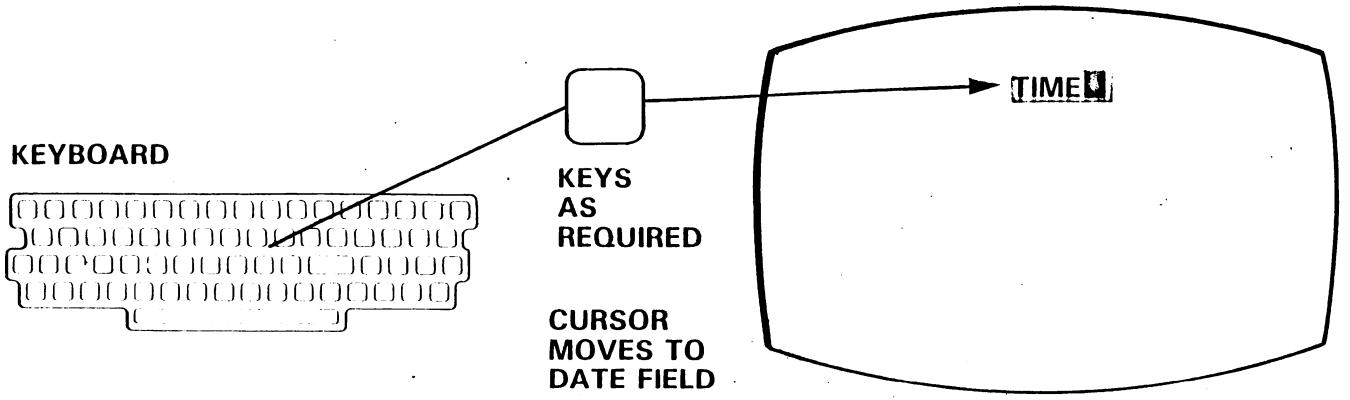
2. Type the letter 'H'. DO NOT type letter 'M' as this will clear the memory.



3 Type in the time.

TIME = 09A30

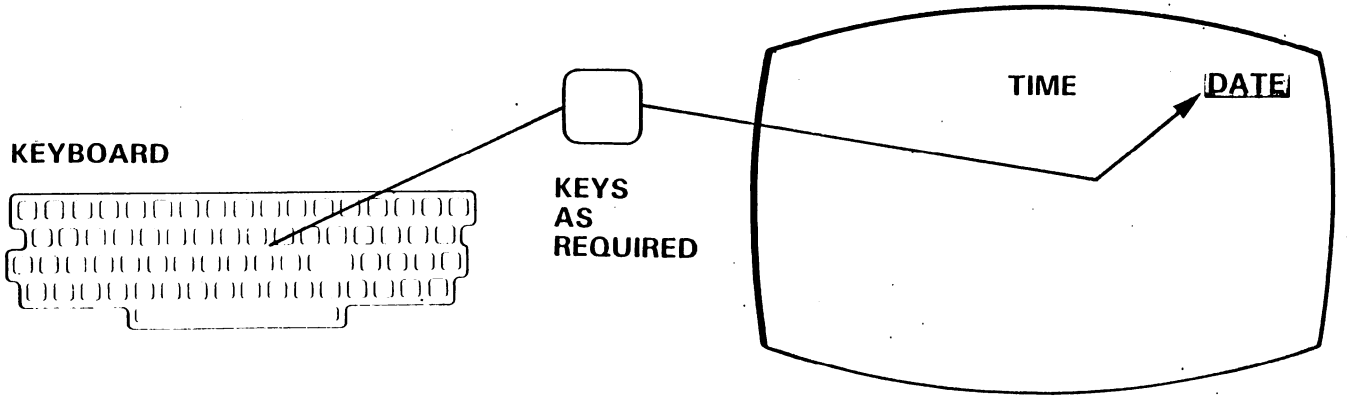
Hour AM or PM Minutes



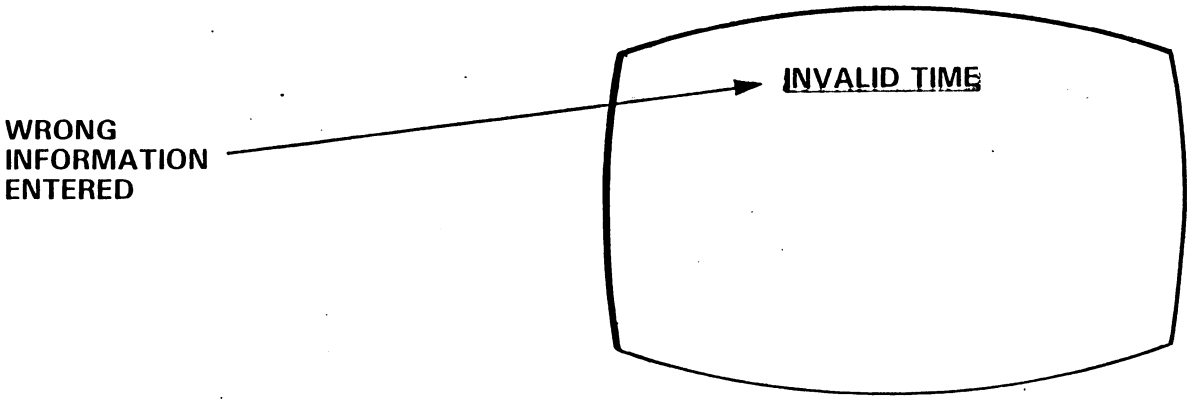
4 Type in the date.

DATE = 2505

Day Month



NOTE: If characters other than valid time/date characters are entered in these field, the service line will display INVALID TIME. Insert the correct information.

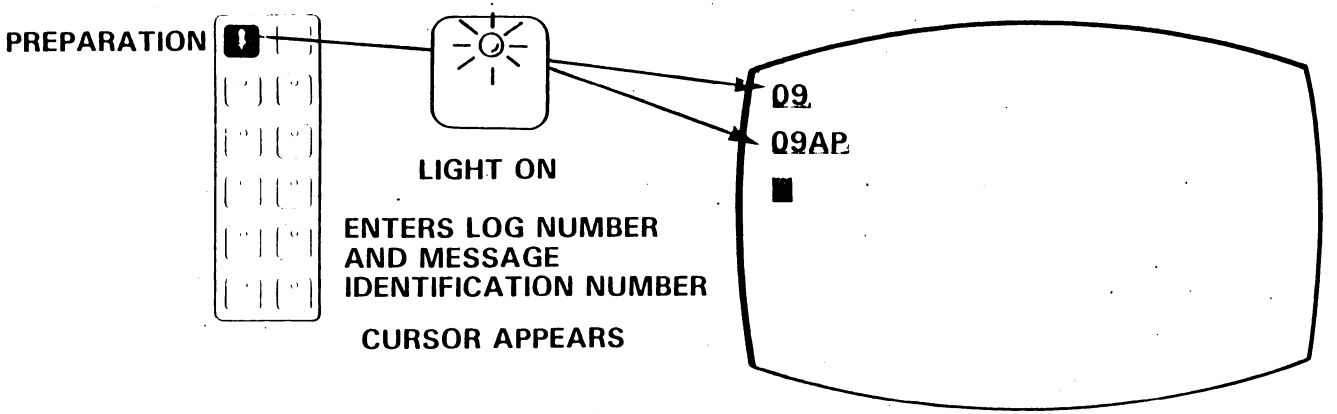


PREPARING A MESSAGE ON THE SCREEN

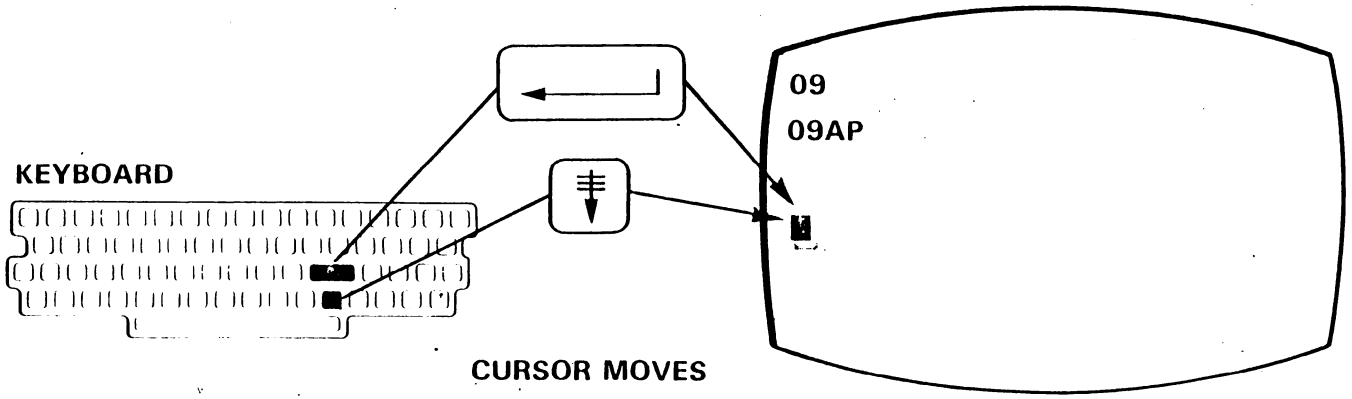
This section describes the preparation of a message on the visual display screen for storage in the memory or for transmission.

1. Press the PREPARATION switch.

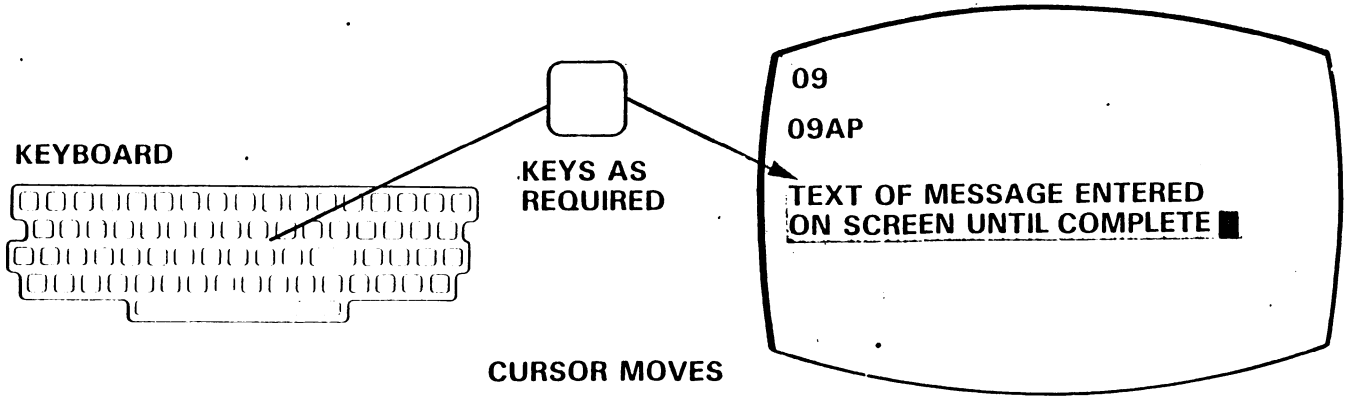
NOTE: The teleprinter moves to a stand-by mode when not in use, and the screen will be blank. If such is the case, press the PREPARATION switch twice.



2. Press the new line and line feed keys on the keyboard.



3. Type the text of the message with the keys on the keyboard.

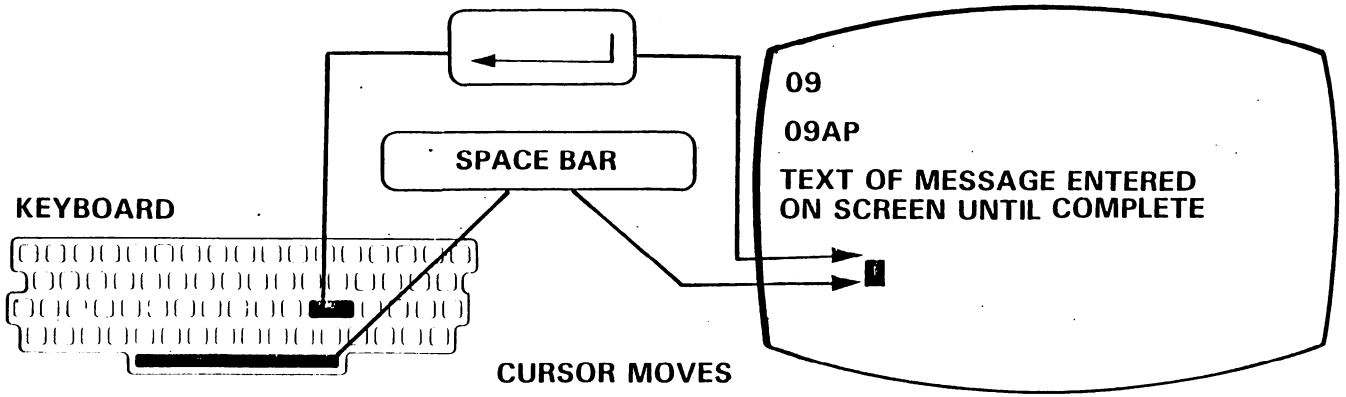


4 If necessary, edit your message.

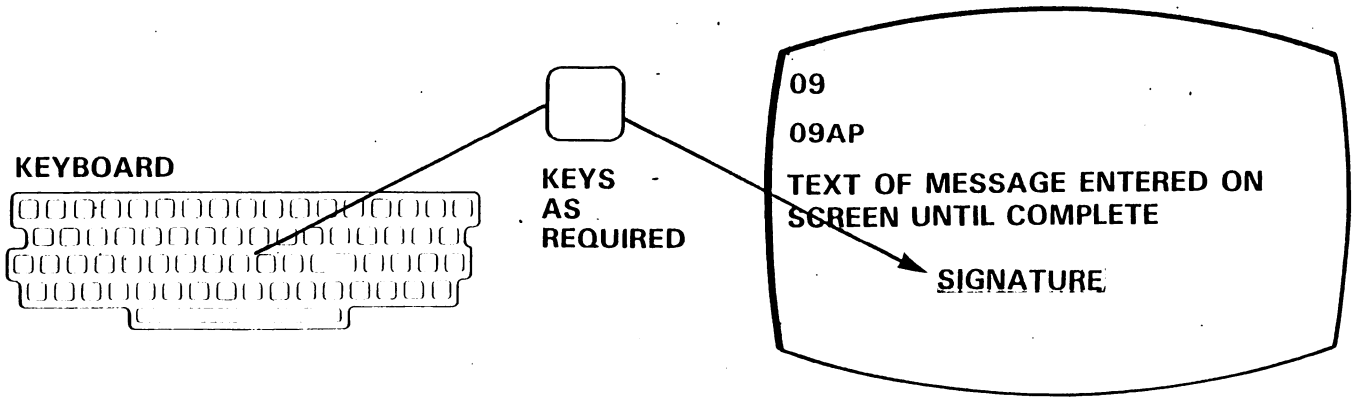
REFER TO PAGE 32

EDITING A MESSAGE

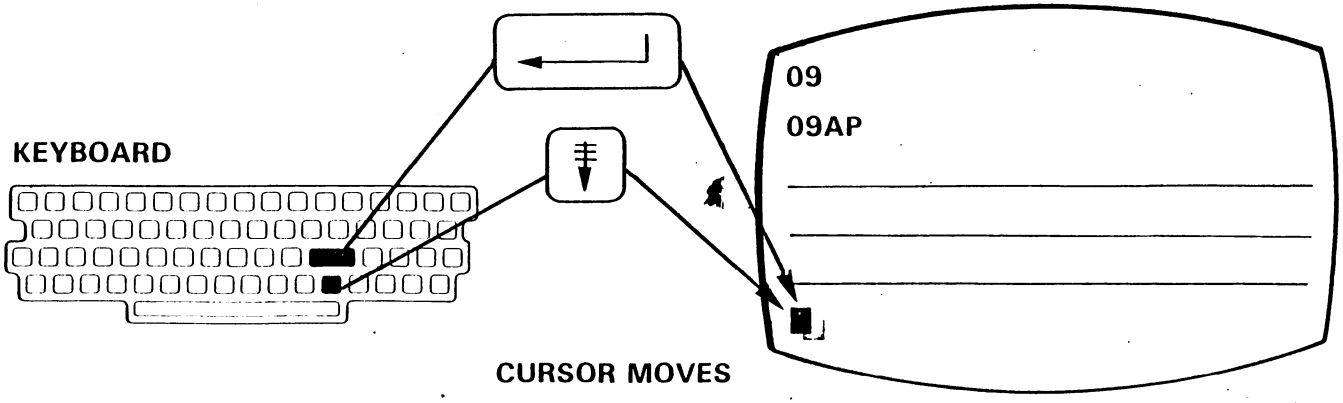
5 Insert five spaces at the end of the message text by pressing the new line key once and the space bar five times.



6 Insert the signature.

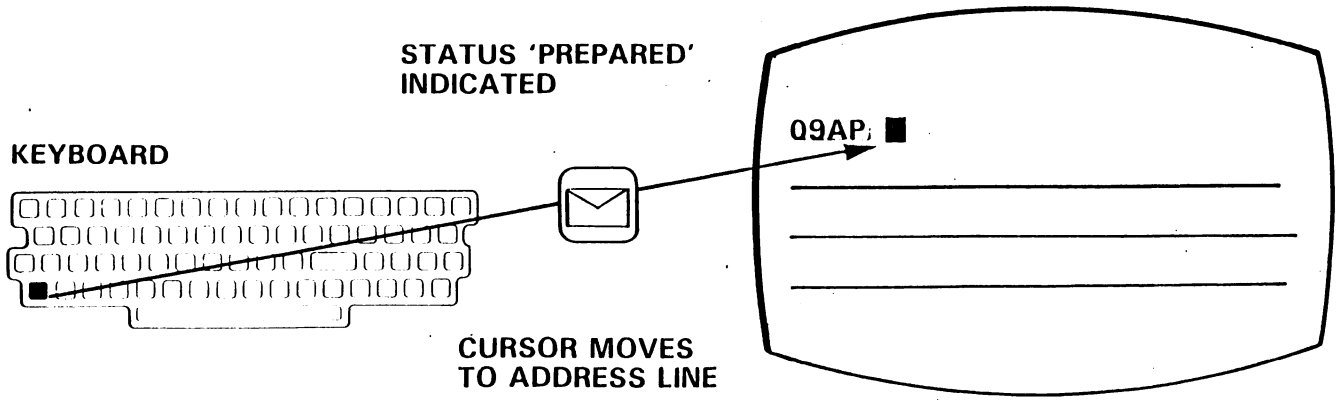


7 Press the new line and line feed keys.



8 Press the end of message key. (EOM).

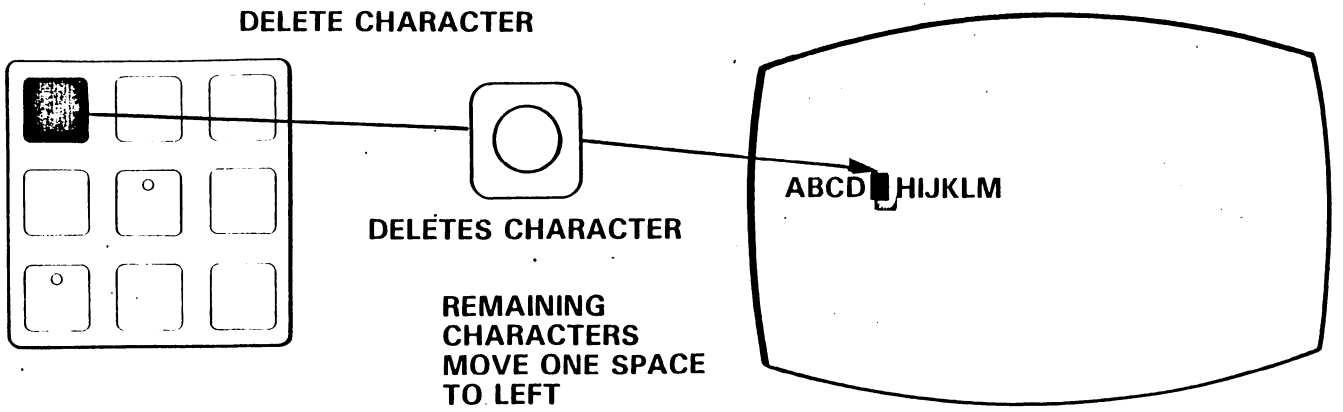
The message is now complete, but requires address details before automatic transmission can be effected. The message identification number includes the prepared status P.



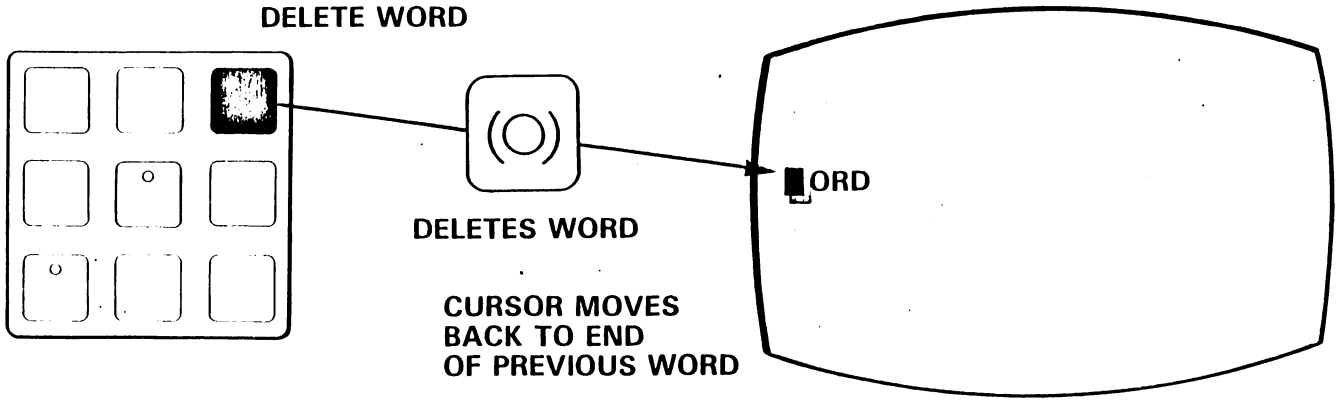
- If the message is to be transmitted manually, refer to page 37 for message labelling.
- If the message is to be transmitted automatically, refer to page 34.

This section describes the editing of a message during preparation on the visual display screen.

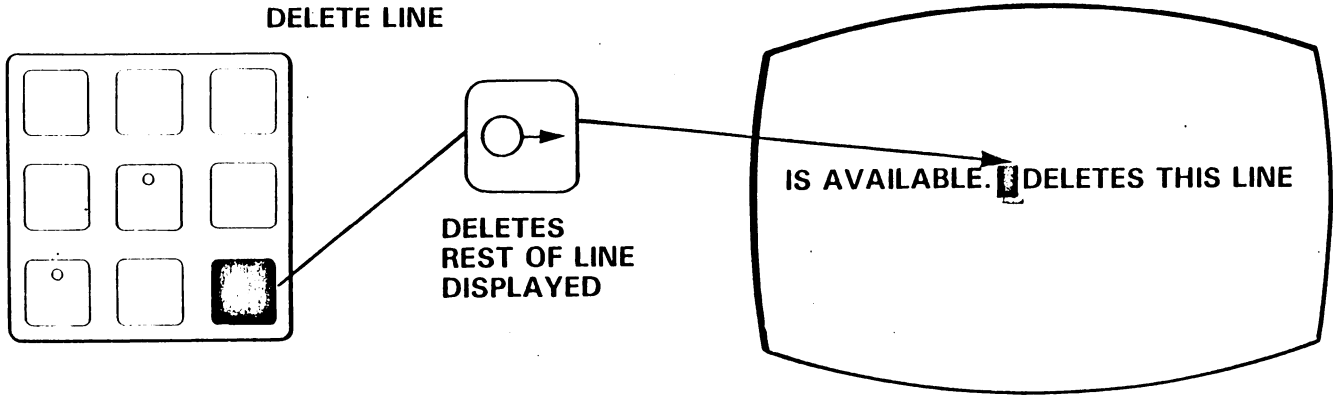
To delete a character, set the cursor on the unwanted character and press the delete character key.



To delete a word, set the cursor on any character of the word to be deleted and press the delete word key.



To delete a line, position the cursor on the first character to be deleted and press the delete line key. The entire line on the visual display screen from that character onwards will be deleted.

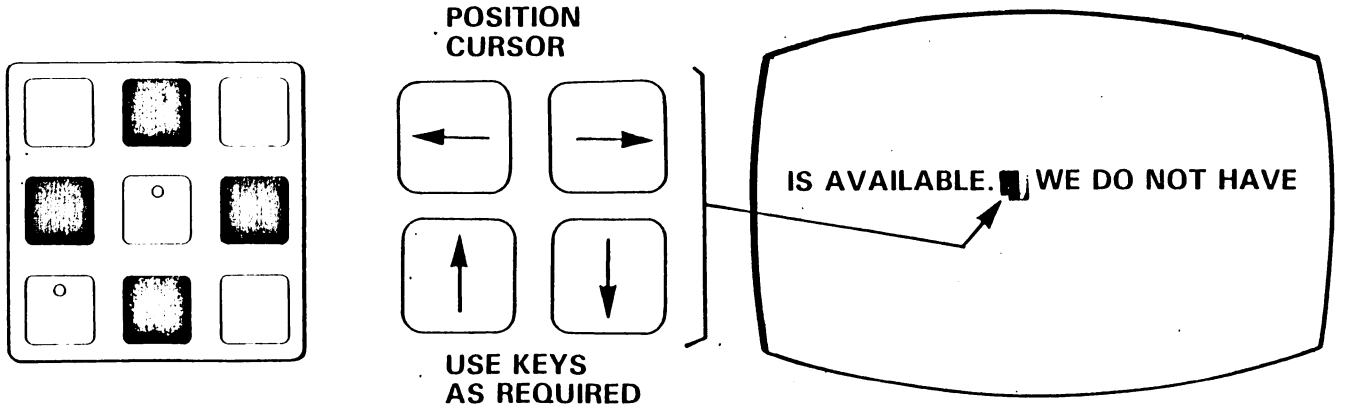


INSERTING CHARACTERS

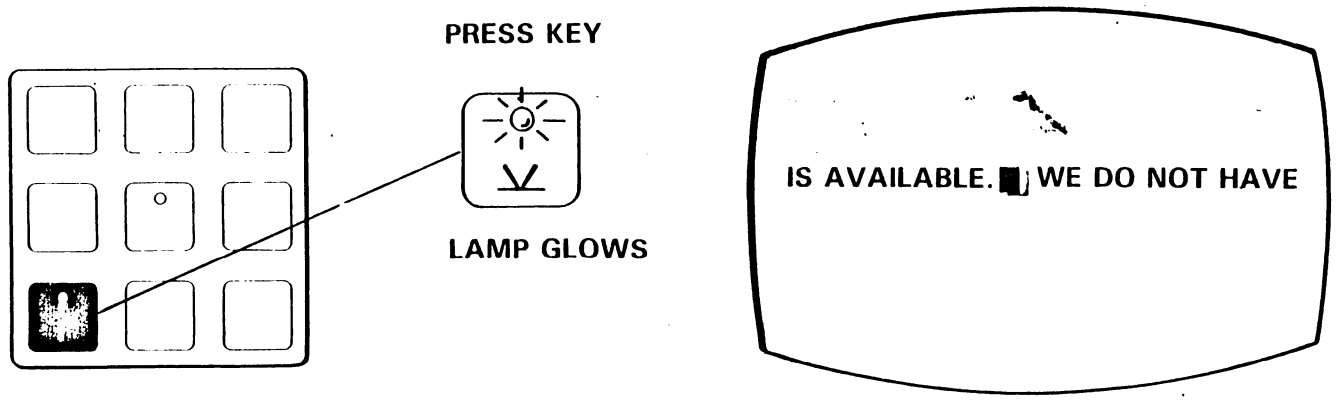
A message may be amended by inserting extra characters.

To insert characters:

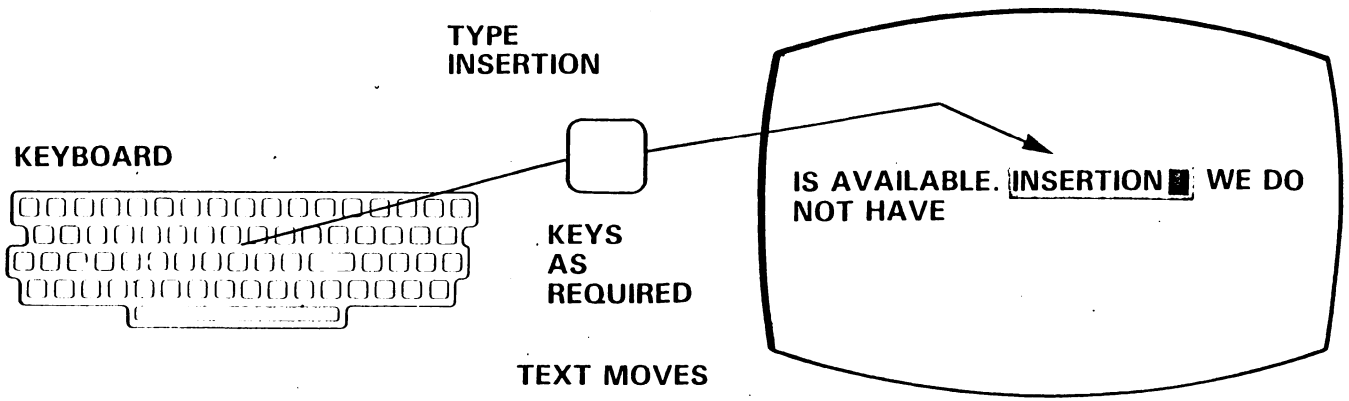
1. Position the cursor at the position where the insertion is to be made.



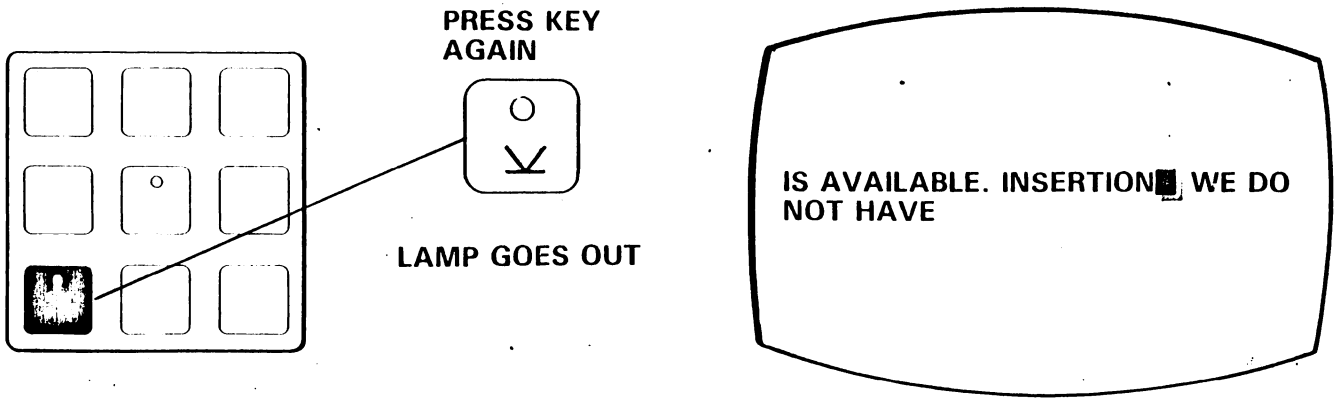
2. Press insert character key. The associated signal lamp glows red.



3. Type the text of the insertion. The text following the insertion moves along automatically.



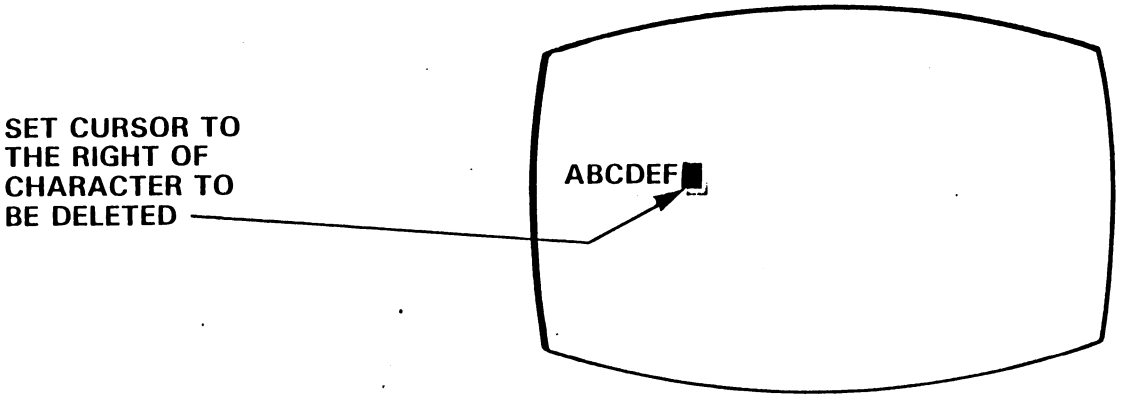
4 After completing the insertion, press the insert character key again. The lamp goes out and the cursor remains at the end of the inserted text.



BACKSPACE ERASE

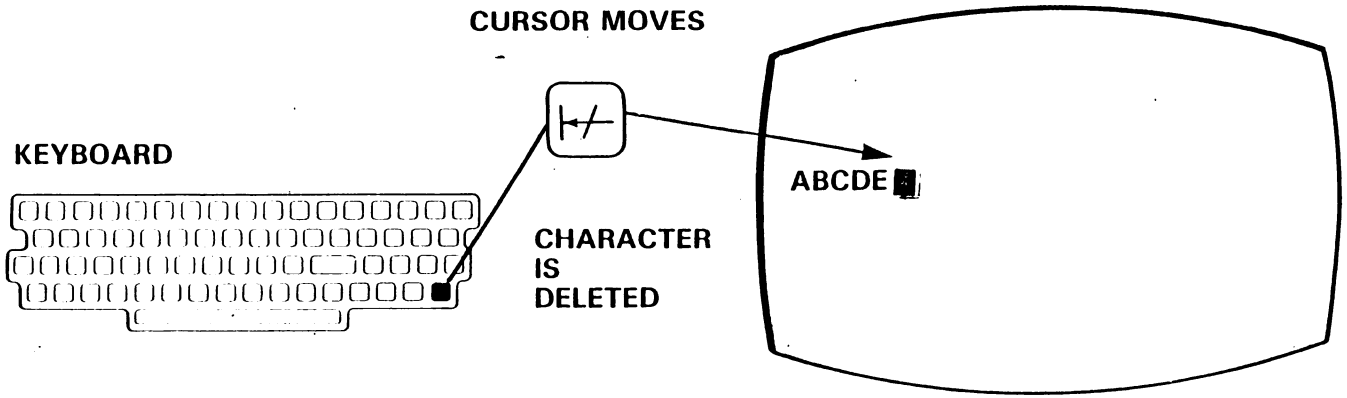
The backspace erase key may also be used to edit a message:

1 Set the cursor to the right of the character to be erased.



2 Press the backspace erase key.

NOTE: Hold down the backspace erase key and it will continue to erase characters until it is released.

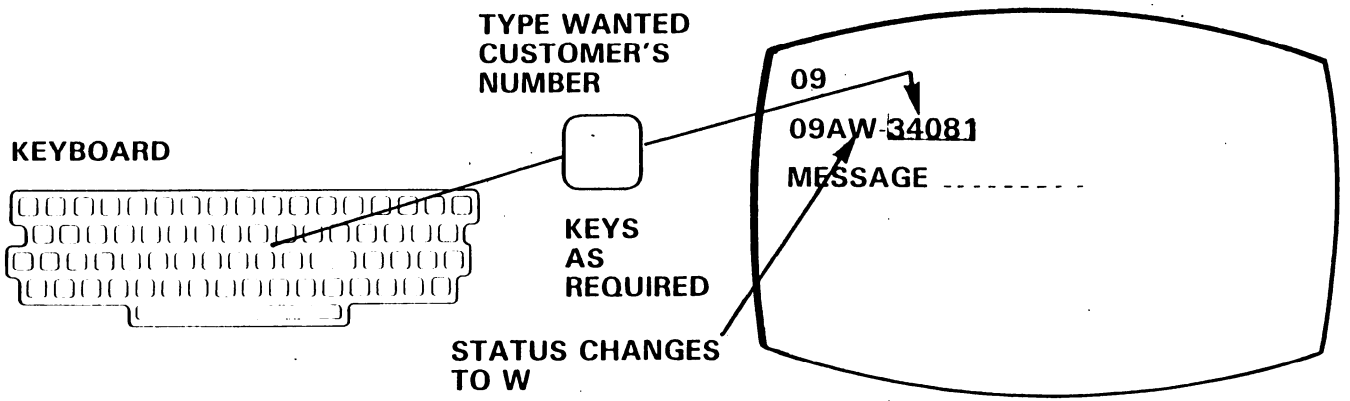


This section describes the preparation of a message for automatic transmission, including re-try after composition on the visual display screen and operation of the end of message key (refer pages 28 to 30).

To address a message for automatic transmission:

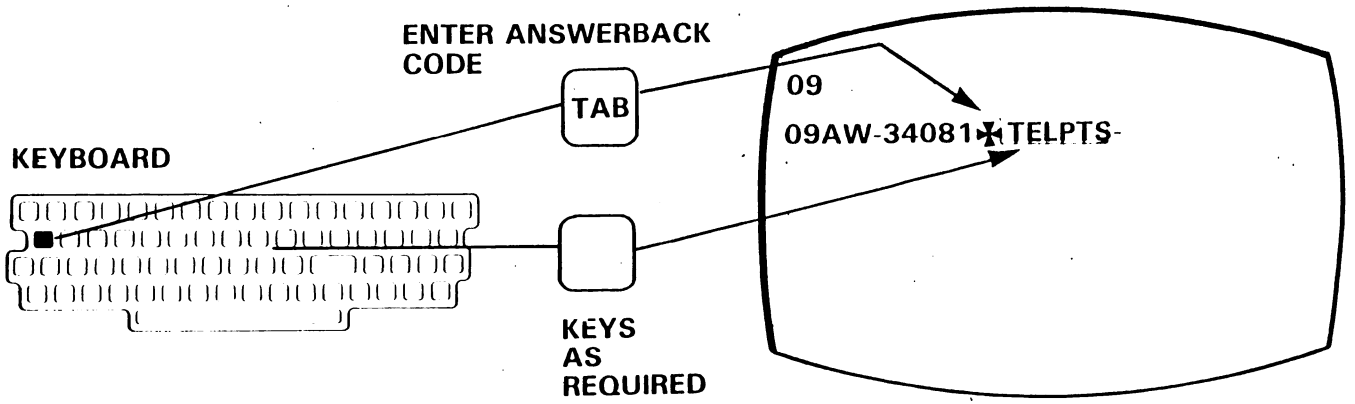
1. Type the wanted customer's number. The message identification number status changes to WAITING (W).

NOTE: If calling overseas, insert 020/ followed by the country code, the wanted telex number and a plus sign.

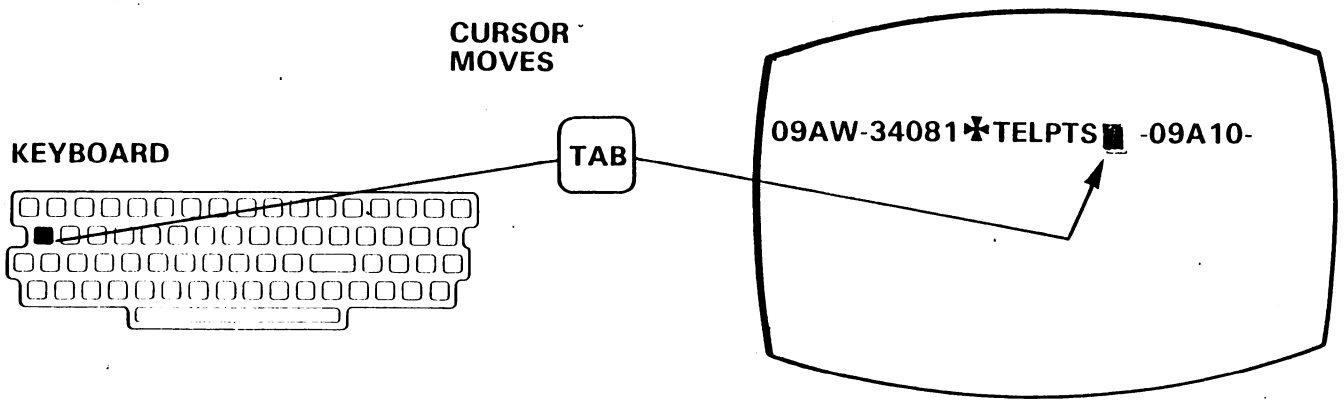


2. Operate the TAB key and enter the answerback code to be verified, if required.

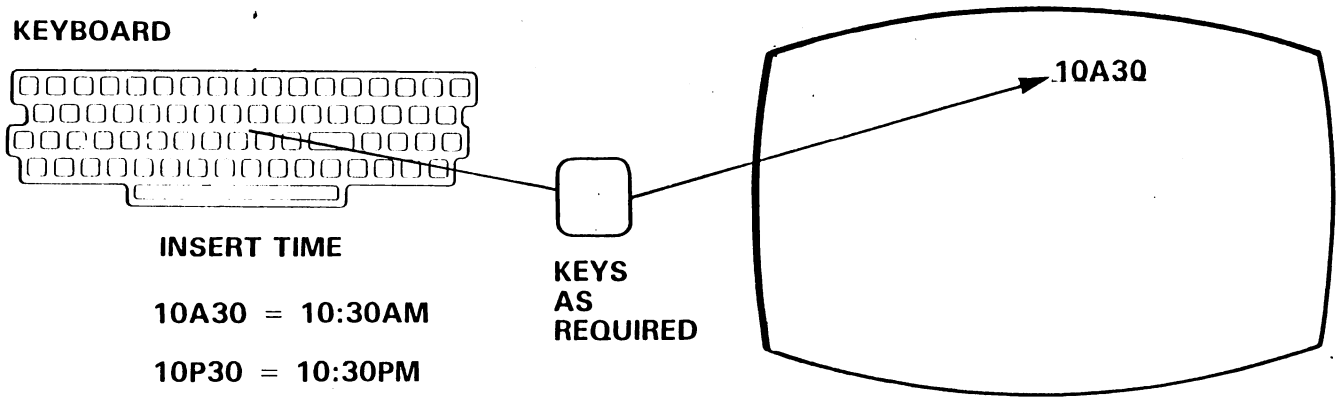
   Up to seven figures or letters may be used. Do not insert spaces.



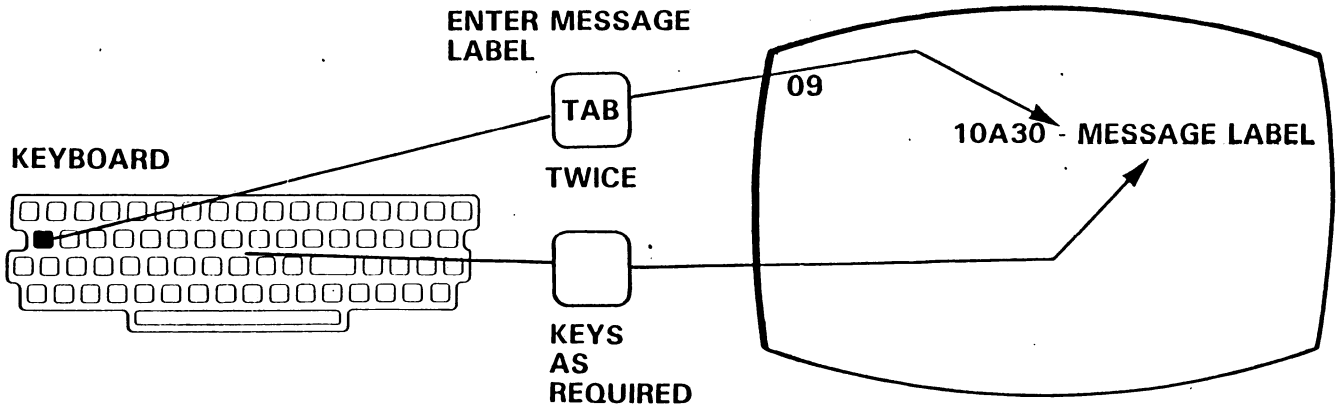
3 Operate the TAB key to move the cursor to the time field in the address line. If the message is to be sent now, leave the current time displayed.



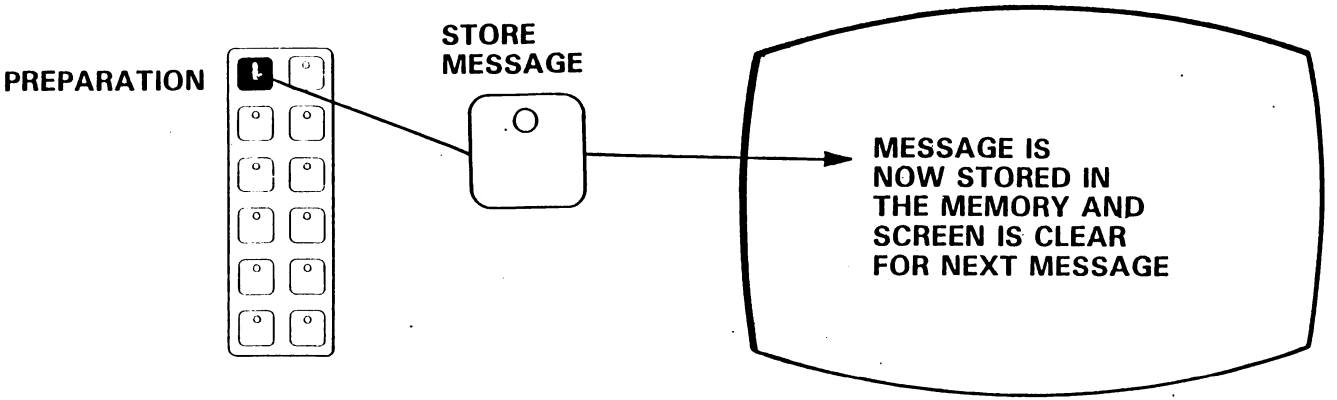
4 If delayed delivery is required, type the time of delivery details. The delivery time may be delayed up to 16 hours. Use the format shown.



5 Operate the TAB key again twice and enter a message label to give you a record of the message contents. Fourteen characters are available for this label.



6 To store the prepared and addressed message in the memory, press the PREPARATION switch.

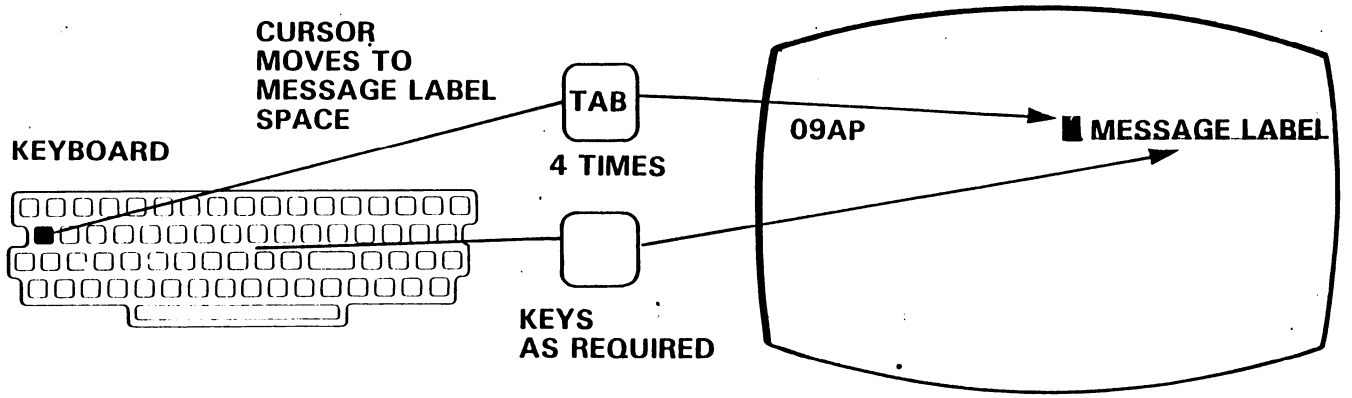


PREPARING A MESSAGE FOR MANUAL TRANSMISSION

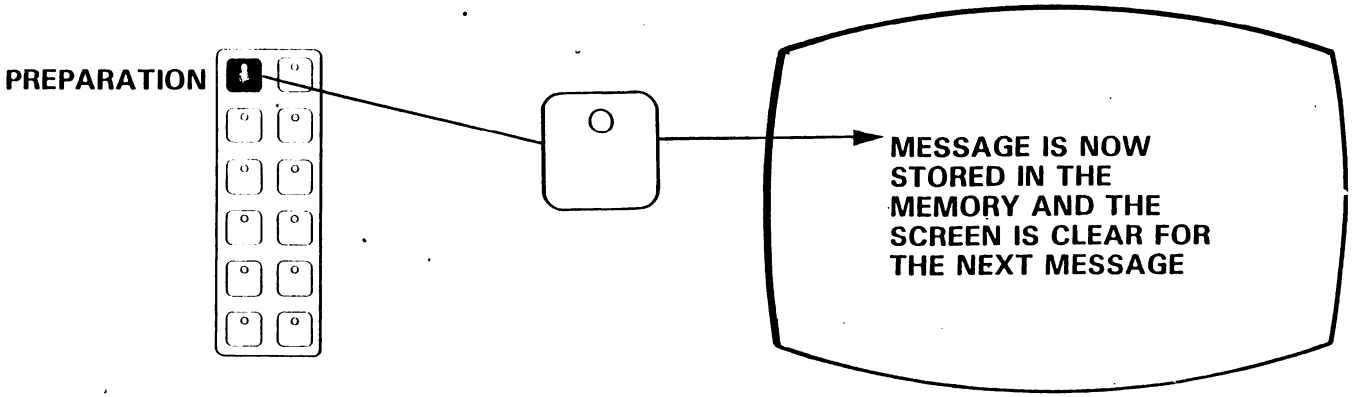
This section describes the preparation of a message for manual transmission after composition on the visual display screen and operation of the end of message key (refer pages 28 to 30).

To label a message for manual transmission:

1. Press the TAB key four times and then enter the appropriate message label.



2. To store a prepared message in the memory, press the PREPARATION switch.



MESSAGE LOG

The memory contains a message log which lists all prepared, transmitted or received messages stored in the memory. The address line details of all the messages stored in the log, the received messages only or the transmitted messages only may be displayed on the visual display screen.

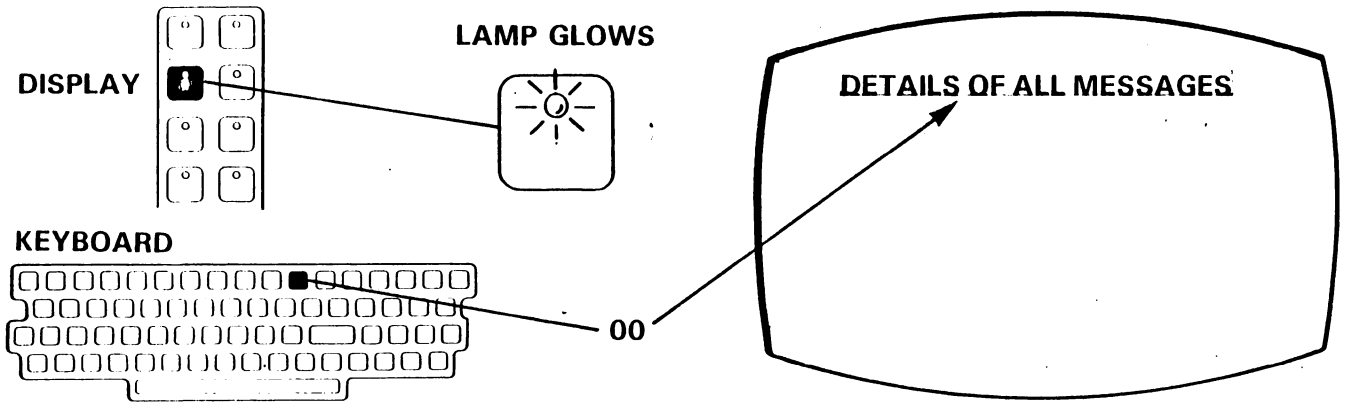
NOTE: Individual messages are numbered from 01 to 97.

ACCESS CODE	
00 ALL MESSAGES	MESSAGE LOG
99 RECEIVED MESSAGES (R)	STORED IN
98 TRANSMITTED MESSAGES (S)	MEMORY

To display the address lines of all messages stored in the memory message log:

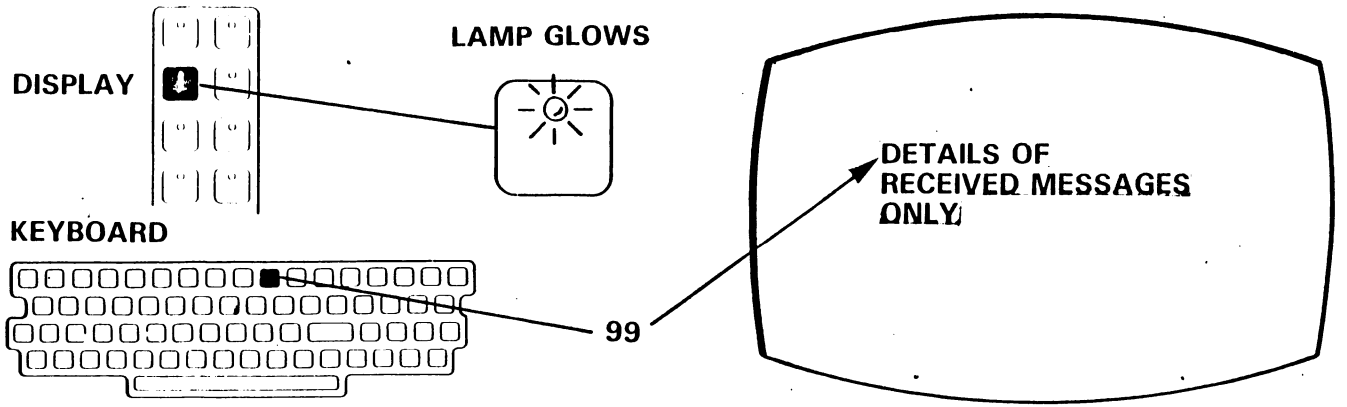
- Press the DISPLAY switch and then type 00. Details of all stored messages, including status, are displayed.

NOTE: To display an individual message, see Section 6 (refer to page 62).



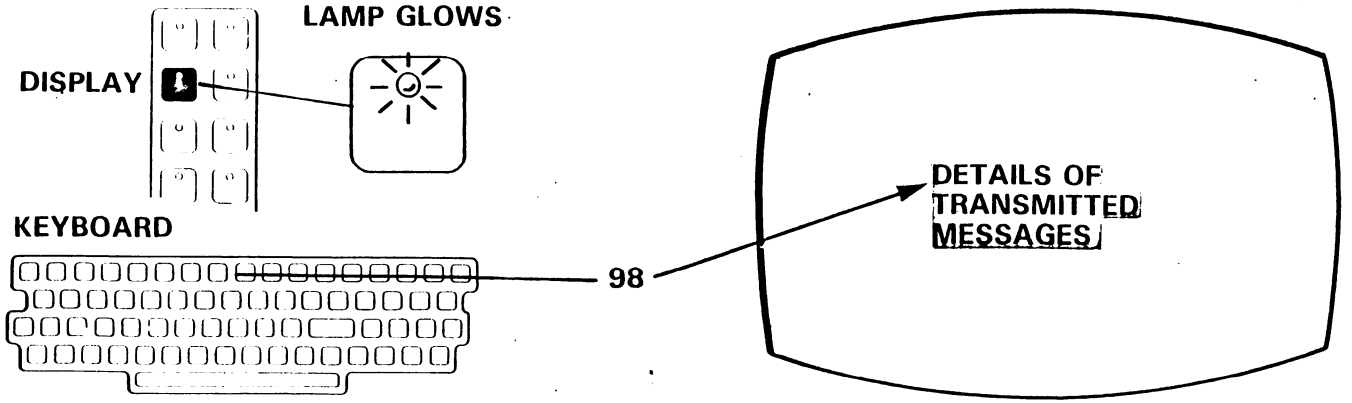
To display received message details stored in the memory message log:

- Press the DISPLAY switch and type 99.



To display transmitted message details stored in the memory message log:

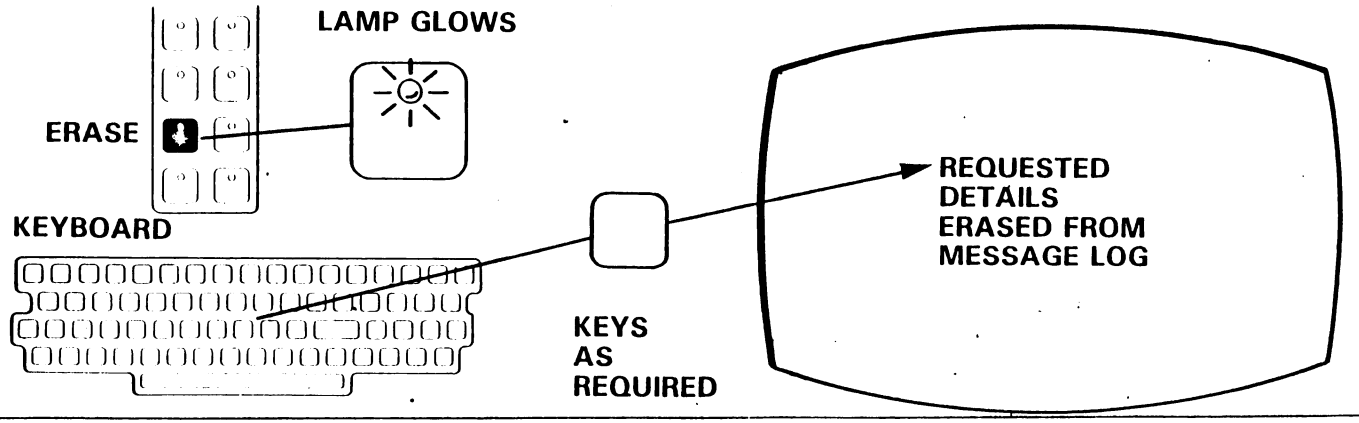
- Press the DISPLAY switch and type 98.



To erase message log components 98 or 99 while displayed:

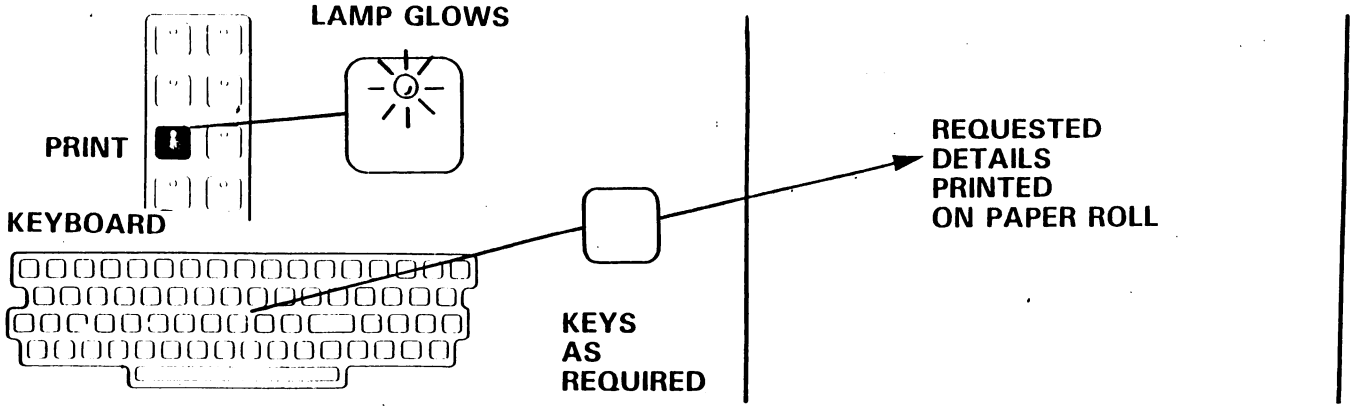
- Press the ERASE key and then type 98 or 99 to erase transmitted or received messages collectively, as required.

NOTE: Log details of messages with a status other than S or R must be erased individually. See Section 6 (refer to page 70).



To print the contents of the message log:

- Press the PRINT switch and then type 00, 98 or 99 as required.



The automatic re-try option permits:

- Continuous automatic transmission of stored messages that have been prepared for automatic calling.
- Sending messages automatically at pre-determined times.
- Automatic re-try of calls which encounter service codes or failure conditions.
- Sending a message to several destinations automatically one at a time.

AUTOMATIC TRANSMISSION

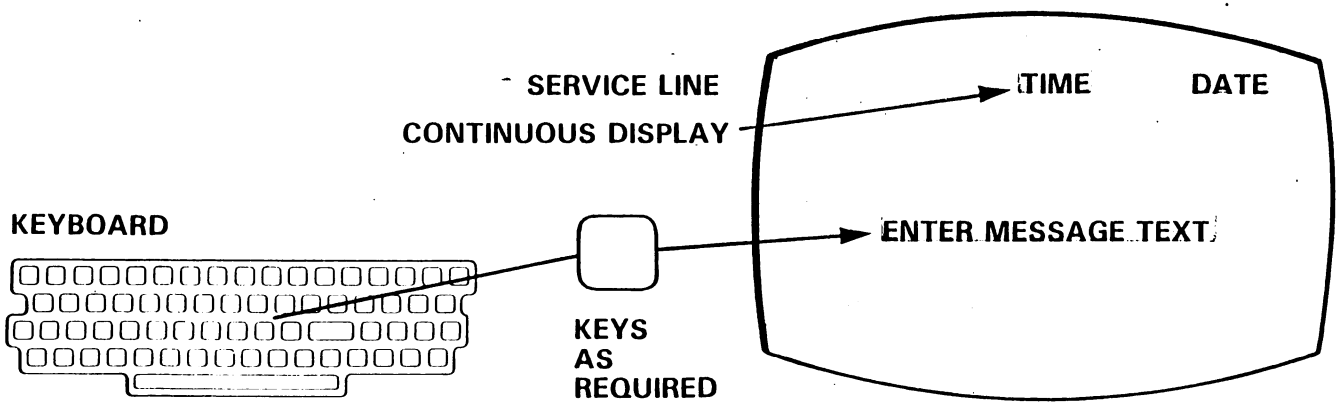
DELAYED DELIVERY

AUTOMATIC RE-TRY

MULTIPLE ADDRESSING

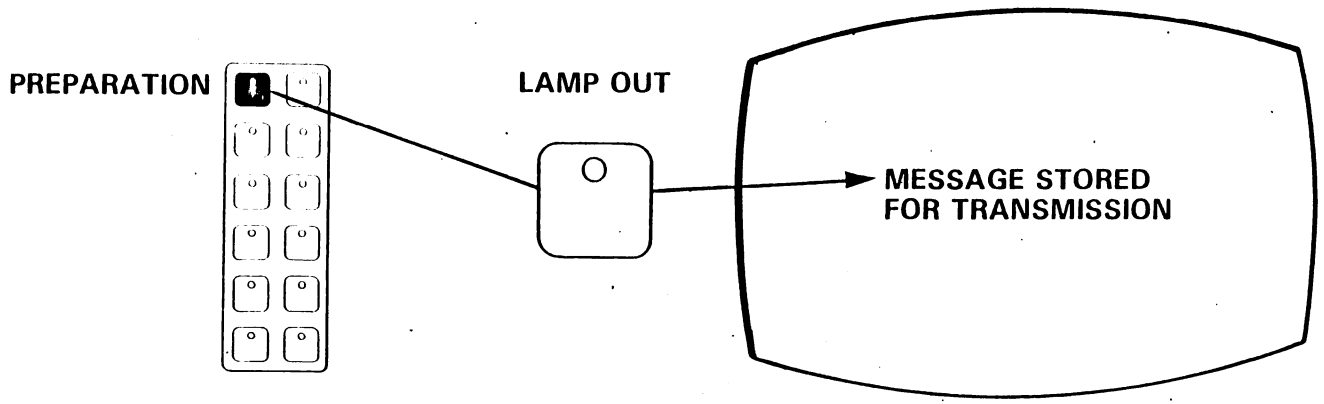
When this option is fitted, the time and date is displayed in the service line of the visual display screen.

PREPARING AND TRANSMITTING AUTOMATIC RE-TRY AND DELAYED DELIVERY MESSAGES



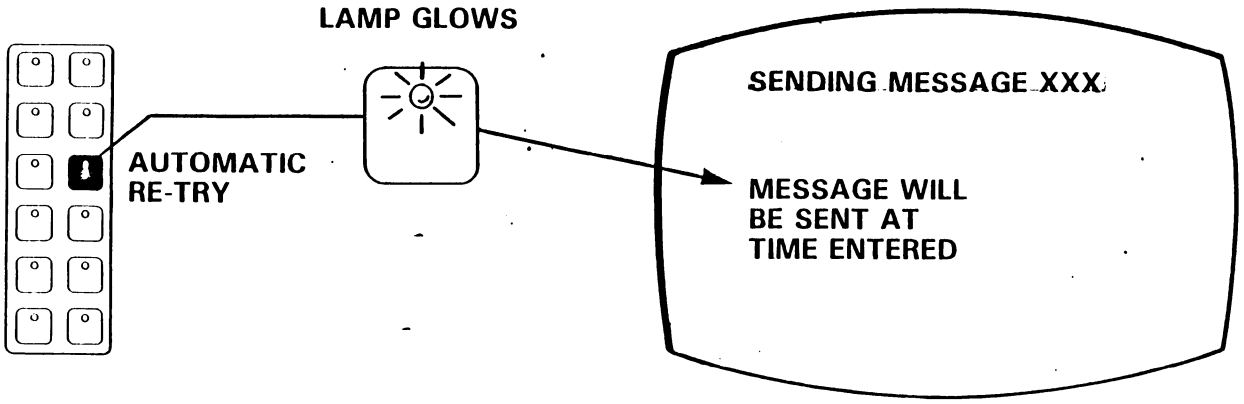
1. Prepare the message on the visual display screen as described on pages 34 to 36.

2. Press the PREPARATION switch. The message is now stored ready for transmission.



3 Press the AUTOMATIC RE-TRY switch. The stored message is now transmitted automatically at the time you have entered.

NOTE: If continuous automatic transmission and re-try is required, the AUTOMATIC RE-TRY switch must be left on.



IMPORTANT: When the teleprinter is idle for a few minutes, it switches to 'Standby'. All lamps (except 'Power On') extinguish. If you have selected RE-TRY for delayed delivery messages, the RE-TRY lamp switches off but the re-try facility is still active.

OPERATION OF THE AUTOMATIC RE-TRY FACILITY (SUCCESSFUL CALLS)

The automatic re-try facility is placed into operation by pressing the AUTOMATIC RE-TRY switch. The associated lamp glows and the facility checks the memory for a message which has the current time and the status 'W' in the address line.

If a message is found, the call starts automatically:

- the AUTOMATIC CALLING lamp glows,
- the service line displays 'SENDING MESSAGE XXX', and
- printing and transmission of the message occurs.

Following disconnection of the call, the message status in the log is changed to S (sent). A printout advises the duration of the connection, the message number and status, and the current time.

Example — Successful Call Printout
— D=01:30-S:21A-H=
10A08

OPERATION OF THE AUTOMATIC RE-TRY FACILITY (UNSUCCESFUL CALLS)

If a call attempt is unsuccessful in the re-try mode, the connection is cleared. A printout includes the reason for disconnection (RFD) and the number of call attempts remaining (depending on the reason for disconnection). The address line in the log is updated to include this information and the time field contains a new time, determined by the RFD, eg OCC-call again in 5 minutes. Call attempts are made again at the specified intervals. The RFD field indicates the number of re-try attempts remaining. When all authorised call attempts have been made, the printout and the log indicates the message status J (rejected). This indicates that no further automatic action will be taken. The operator should investigate the problem and take the appropriate action to send the message again or report the matter to the Service Centre.

To amend or send a message which has been rejected, it should be duplicated to create a new message.

Example — Unsuccessful Call Printout
— D=00:20-J:21B-H=
10A25-RFD:OCCO

NOTE: Reason for disconnection — called service occupied, no re-try attempts remaining.

See page 43, for RFD code details.

If a message is rejected for an unknown reason with other codes appearing in the RFD field, report the circumstances to the Service Centre.

DISCONNECTION CODES

The Reason For Disconnection (RFD) field may contain a code followed by a figure from 0 to 9. The figure indicates the number of re-tries remaining after the last call attempt, while the code shows the reasons why the call was disconnected:

CODE	Reason for disconnection	Number of call attempts allowed	Time between re-tries	Action to be taken if message rejected
OCC	Occupied: the called party is busy	8	5 mins*	Try again later or call Service Centre for a check.
NC	No circuit or equipment is available at the moment	8	5 mins*	Call Service Centre.
ABS	The called party is absent	2	1 min	Call Service Centre for details.
NA	Not admitted: this call is not authorised	2	1 min	Refer to sender.
NP	No party: you may have selected a wrong number	2	1 min	Check the telex number.
MOM	Manual operator: use the manual call mode	2	1 min	Use manual calling mode.
DER	The called service is out of order or changing roll	2	5 mins	Call Service Centre.
CAB	Check answerback — Verification failed	2	2 mins	Check answerback details.
NAB	No answerback	2	2 mins	Call Service Centre.
CSM	Check stored message — Memory full?	—	—	Erase unwanted messages.
NCH	Number changed	2	1 min	Check directory or call Service Centre.

NOTE: If a message is rejected with other codes appearing in the RFD field, eg two figures, report the circumstances to the Service Centre.

* NOTE: There will be a 15 minute wait after four tries.

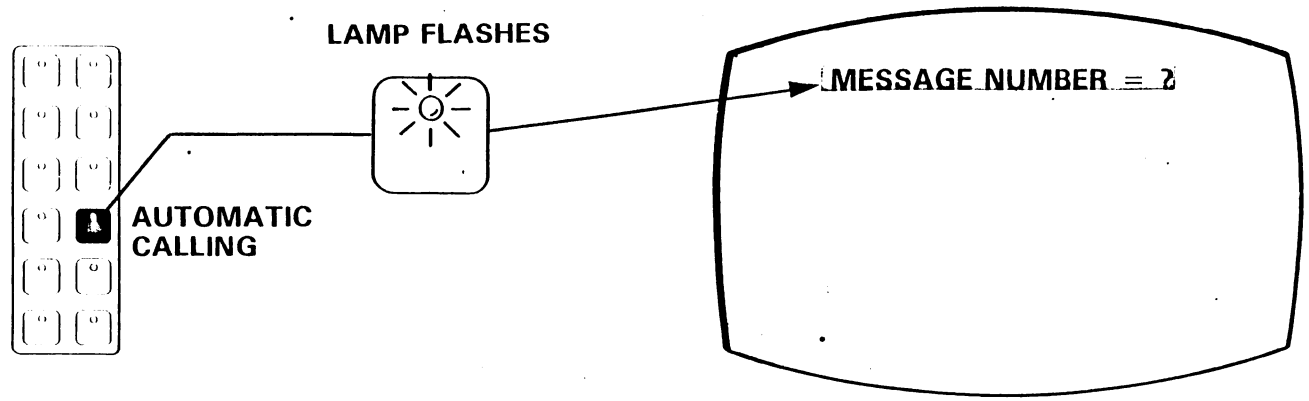
AUTOMATIC CALLING

Provided that a stored message includes the wanted number in the address line, the message may be transmitted automatically using the automatic calling function.

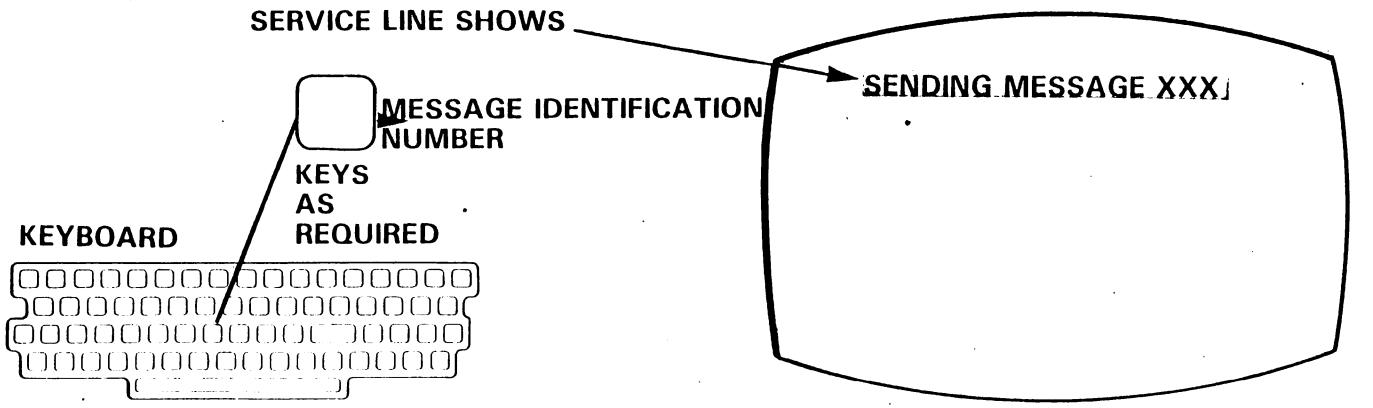
To transmit a message automatically:

1. Check the message identification number of the message to be sent.

2. Press the AUTOMATIC CALLING switch. The service line will display MESSAGE NUMBER = ?



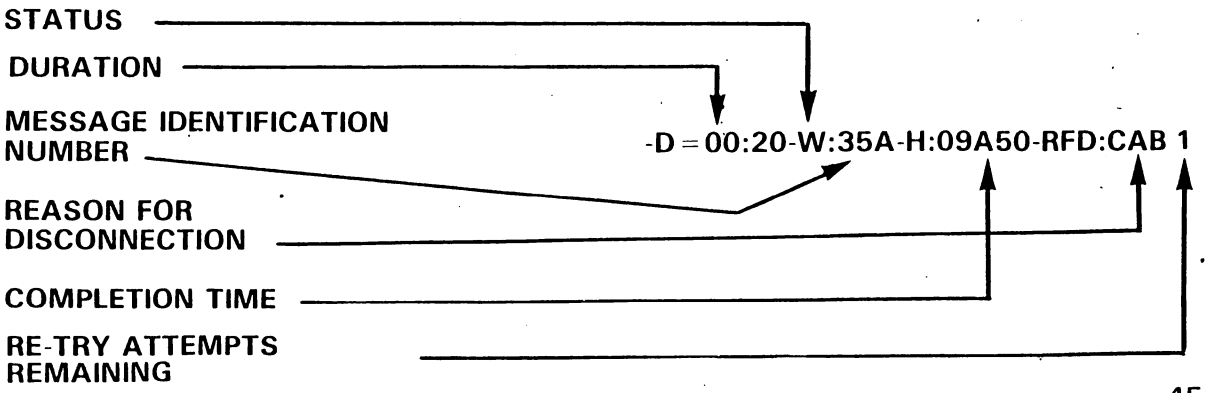
3 Type the message identification number of the message. The AUTOMATIC CALLING lamp glows, the service line on the visual display screen indicates Sending Message XXX, and the printer starts.



When transmission is complete the AUTOMATIC CALLING and PRINTING lamps go out.

UNSUCCESSFUL CALLS

If the call is unsuccessful for some reason, the printout on the paper roll indicates that the call has failed. The printout also shows the duration of the call, the message identification number, the message status and the time of completion.



MANUAL CALLING

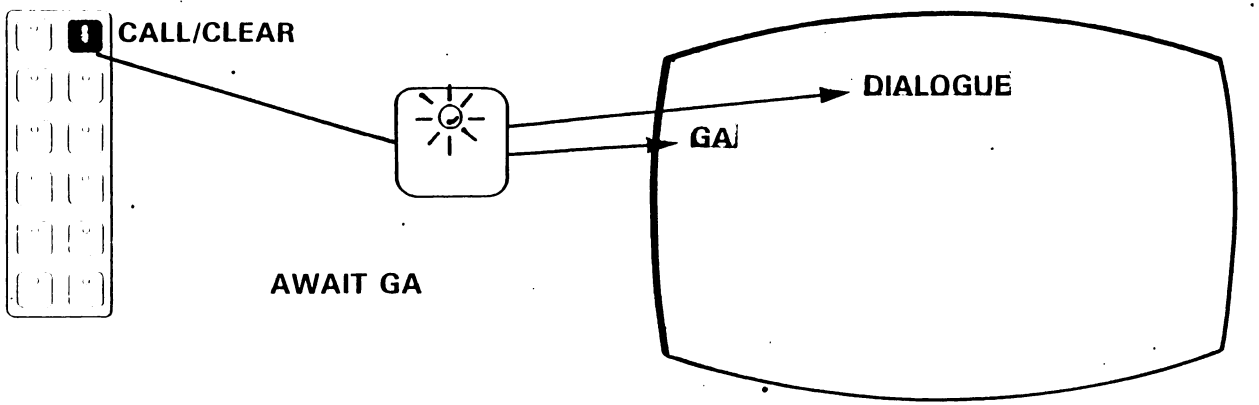
This section describes how to transmit a message stored in the memory.

CAUTION: Make sure you have the wanted Telex number and the message identification number of the message to be sent.

NOTE TELEX NUMBER AND MESSAGE IDENTIFICATION NUMBER BEFORE PROCEEDING

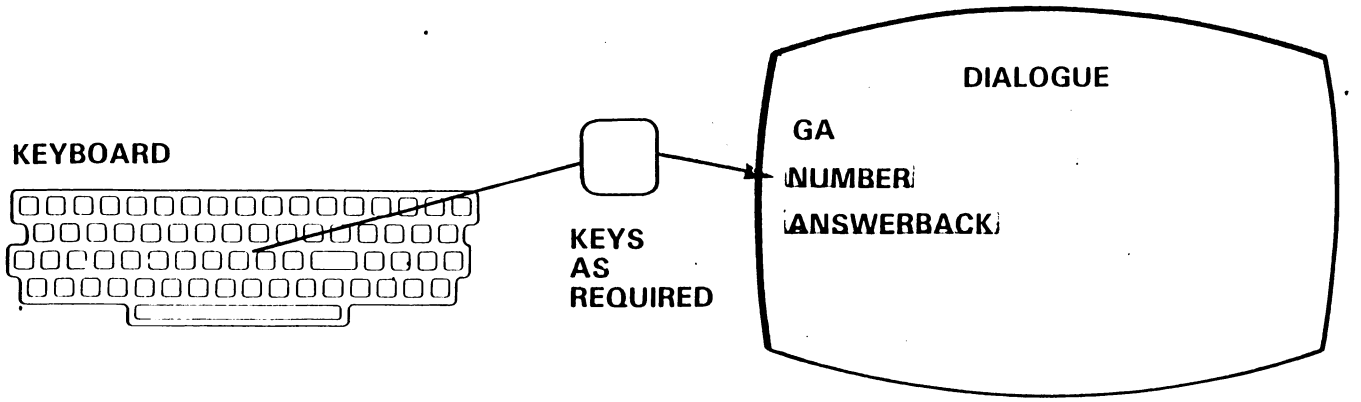
To transmit a message from the memory:

1. Press the CALL/CLEAR switch and wait until GA appears on the visual display screen and the paper roll.

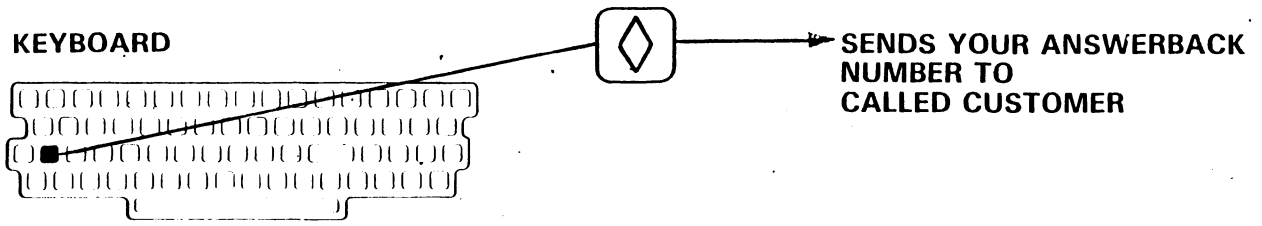


2. Type the customer's number. You may use the abbreviated numbering facility if required.

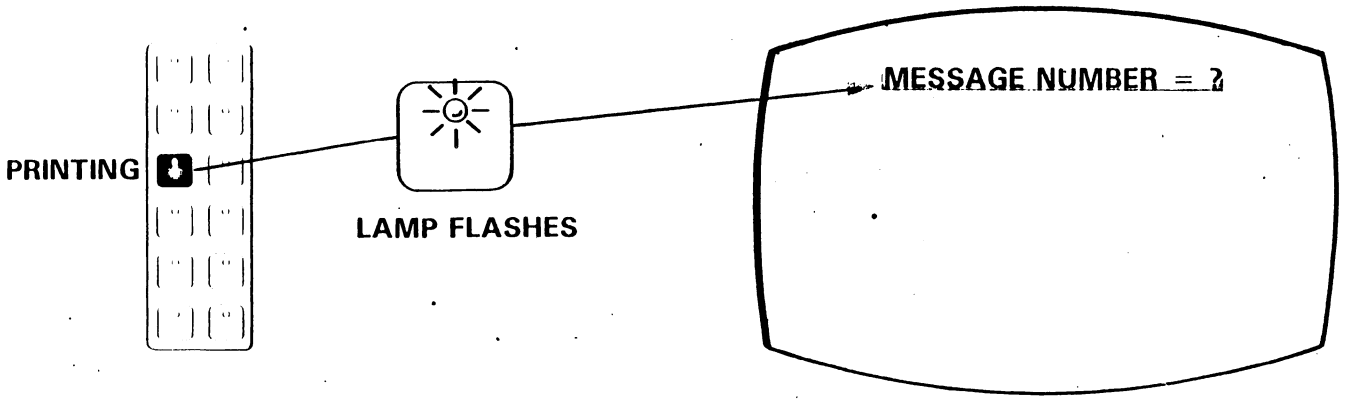
The wanted customer's answerback will also appear.



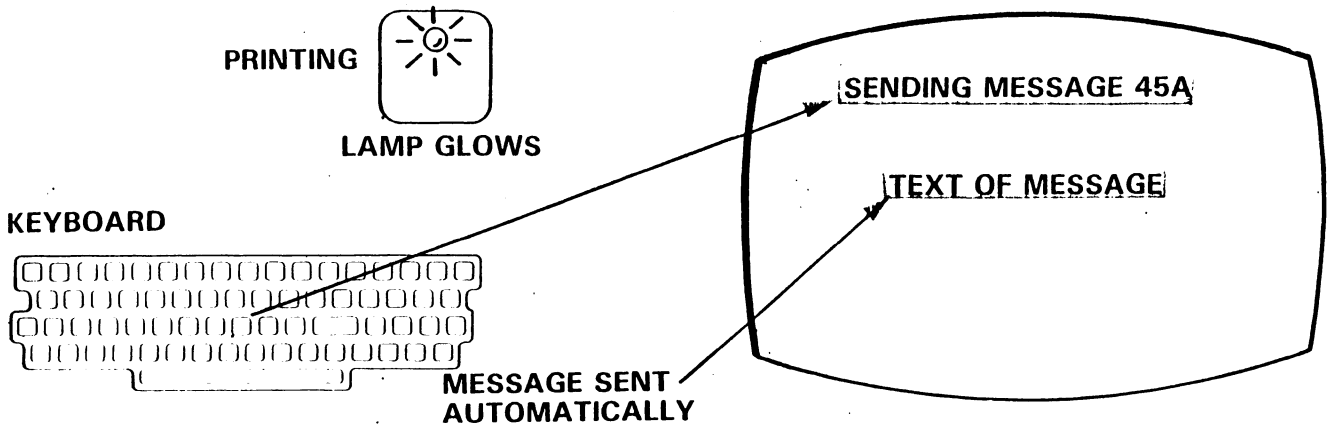
3 Press the HERE IS key.



4 Press the PRINTING switch. The lamp on this key flashes and MESSAGE NUMBER? appears on the service line of the visual display screen.

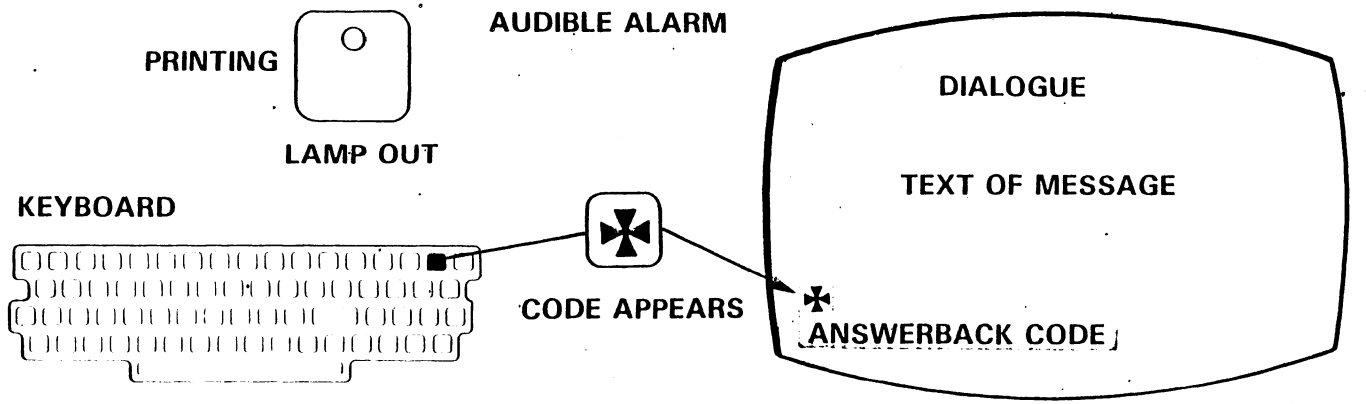


5 Type the message identification number of the message to be transmitted from the memory. The message appears on the visual display screen, is printed by the printer and transmitted automatically.

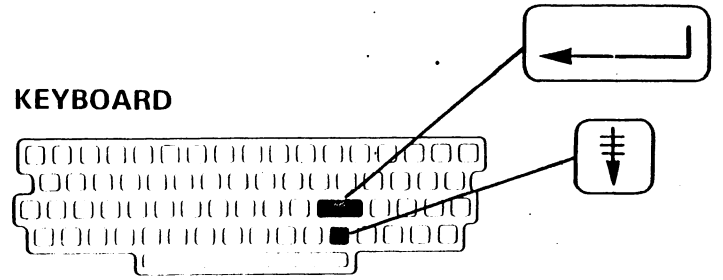


6 When the message has been transmitted, the PRINTING lamp goes out and the audible alarm sounds. The visual display screen will display DIALOGUE.

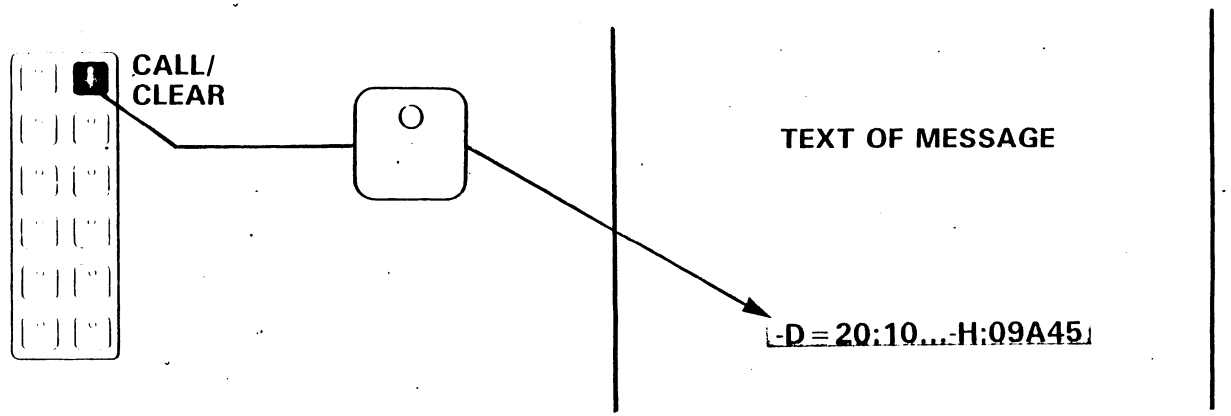
Press the who are you key and wait for the Answerback.



7 Press the new line and line feed keys.



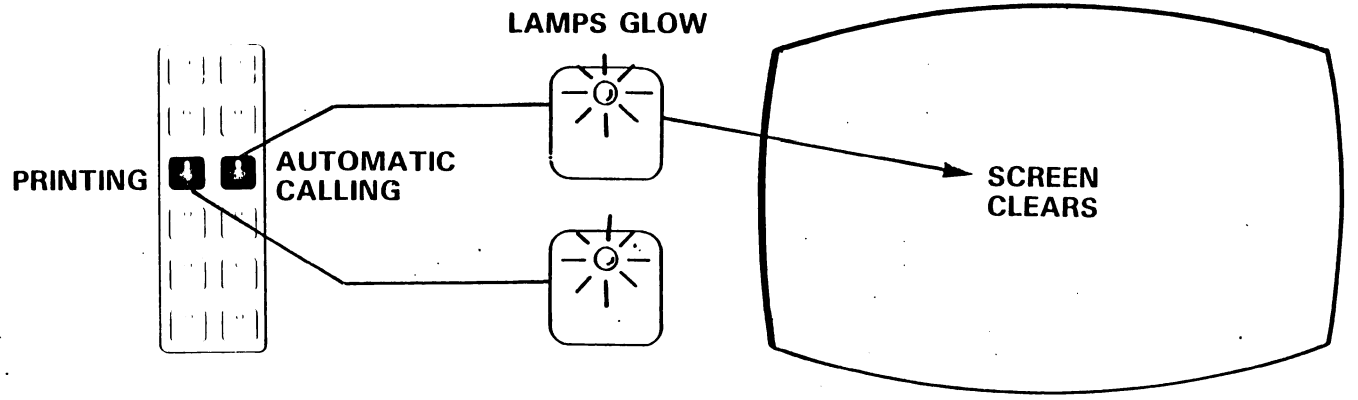
8 Press the CALL/CLEAR switch. This clears the line. The duration of the connection and the completion time is printed with the text of the message on the paper roll. The message has been transmitted.



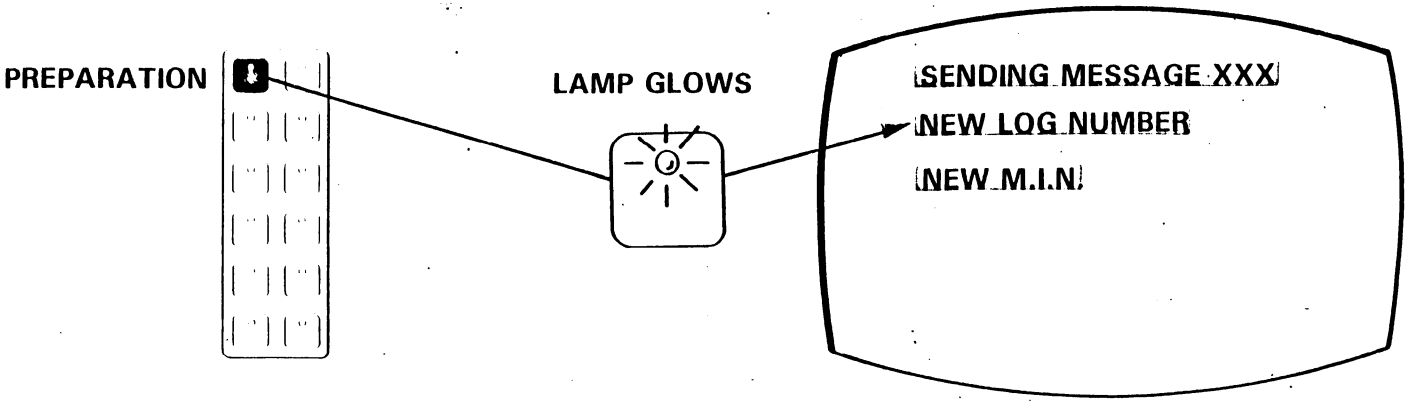
CHANGING TO AUTOMATIC TRANSMISSION

After the message identification number has been typed during manual calling, the transmission of the message proceeds. If required, the visual display screen may be used to prepare another message.

1. Press the AUTOMATIC CALLING switch. The CALL/CLEAR lamp goes out and the AUTOMATIC CALLING lamp glows.



2. Press the PREPARATION switch. A new log number and message identification number appears on the visual display screen. The call being transmitted is completed automatically.



INTERRUPTIONS TO AUTOMATIC TRANSMISSION

When transmitting messages to line automatically, interruptions may occur due to either:

- interference on the line, or
- the receiving operator wanting to stop the transmission.

One of two conditions may occur:

- A single character is received which interrupts transmission, automatic transmission pauses, the teleprinter transmits XXXXX and new line, and the teleprinter automatically recommences transmission at the start of the line where it was interrupted.
- A series of characters interrupt transmission or the receiving operator sends 'PPP' to stop transmission; automatic transmission stops, the PRINTING lamp flashes, the service line displays BREAKBACK and the audible alarm sounds briefly.

To continue transmission without conversation from the keyboard, press PRINTING to recommence transmission at the start of the line where the message was interrupted. Otherwise, keyboard conversation may proceed by:

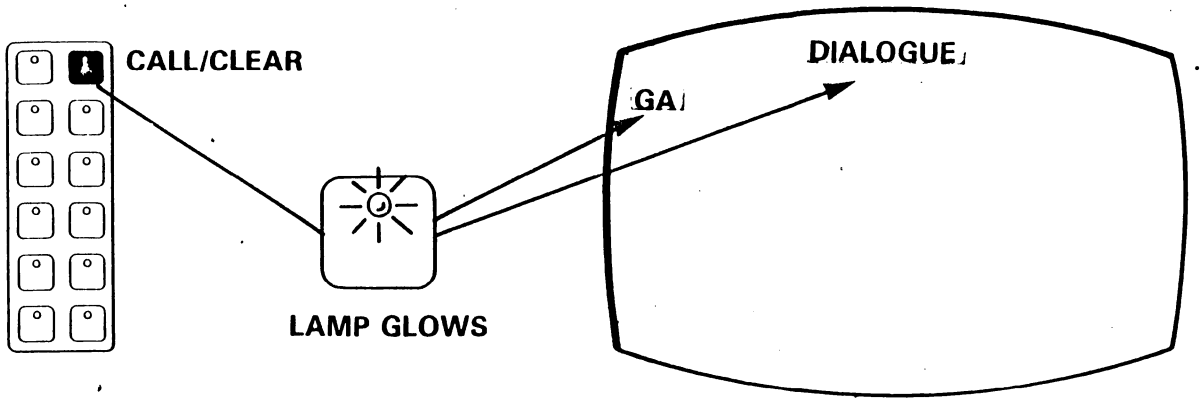
- press the CALL/CLEAR switch,
- the AUTOMATIC CALLING lamp goes out the CALL/CLEAR lamp glows,
- the service line displays DIALOGUE,
- keyboard conversation may now proceed.

To repeat the message from Memory:

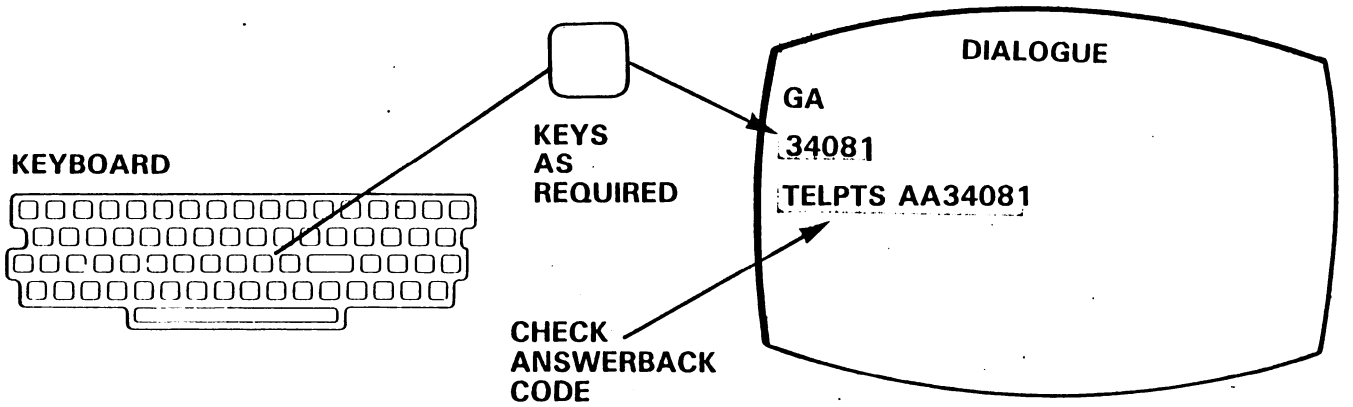
- press the UNLOCK switch and the PRINTING lamp goes out,
- press the PRINTING switch and the PRINTING lamp flashes again,
- type in the message identification number;
- the PRINTING lamp glows and the service line displays SENDING MESSAGE XXX,
- the message is retransmitted from the start.

This section describes how to transmit a message direct from the keyboard. To proceed:

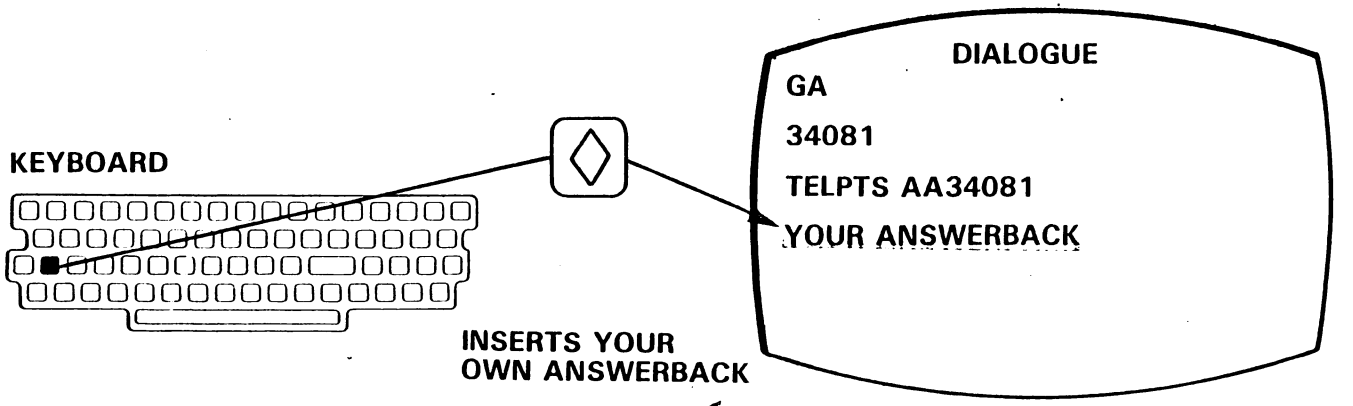
1. Press the CALL/CLEAR switch. The service line indicates DIALOGUE and GA appears in message field on the visual display screen and on page copy. If the machine is on standby, press the CALL/CLEAR switch twice.



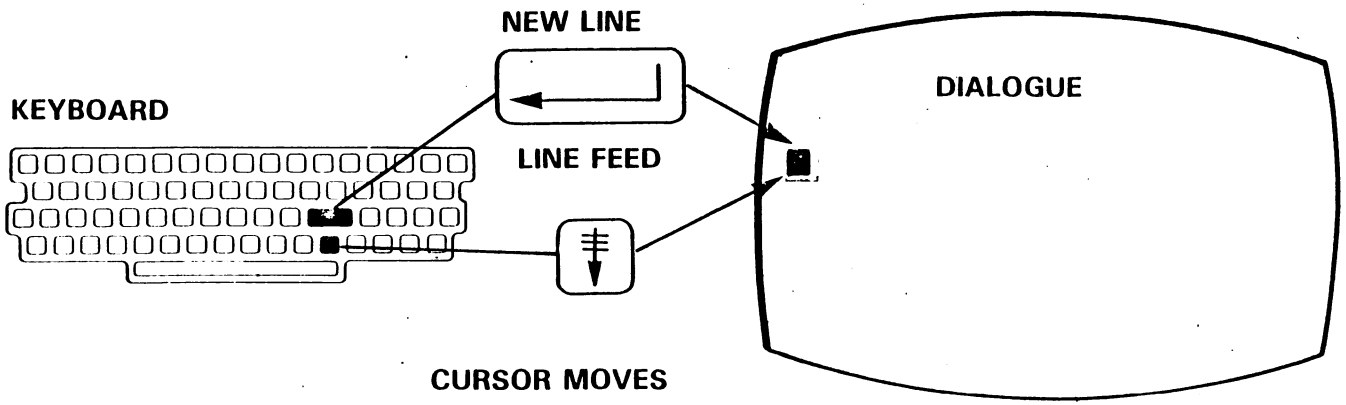
2. Type the wanted customer's number. Do not pause or space during typing. The abbreviated numbering facility may be used if desired. The distant answerback code appears on the screen and on the printer.



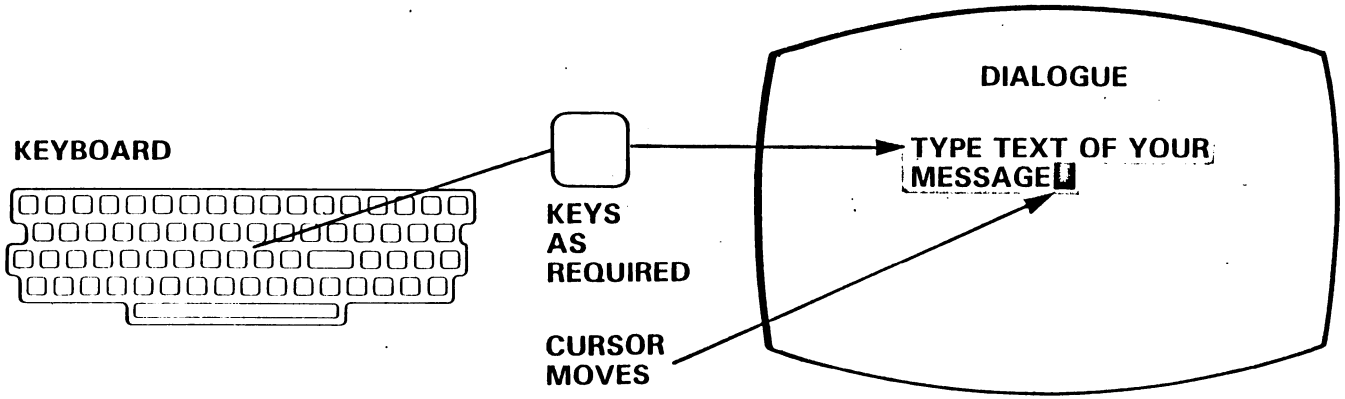
3. Press the here is key to identify yourself.



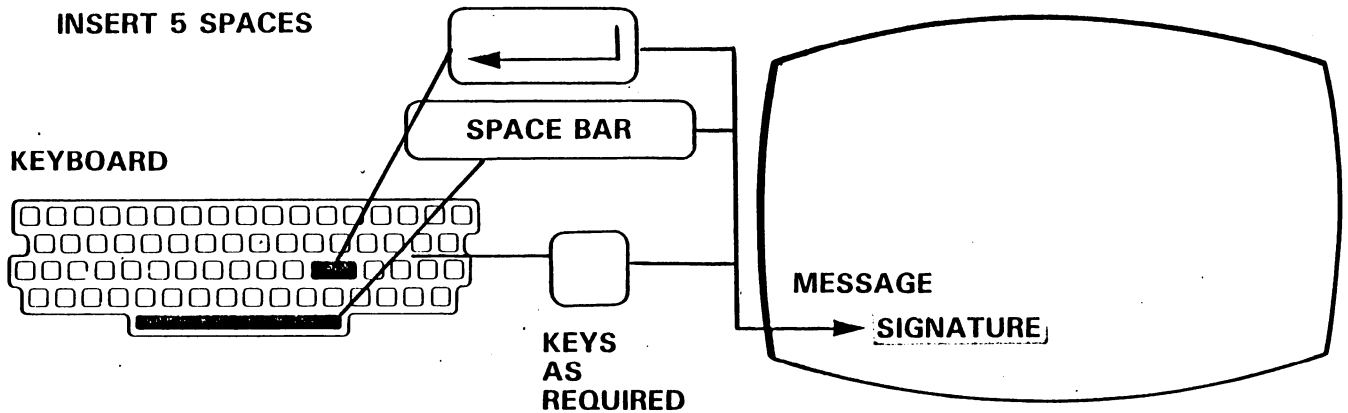
4 Press the new line and line feed keys.



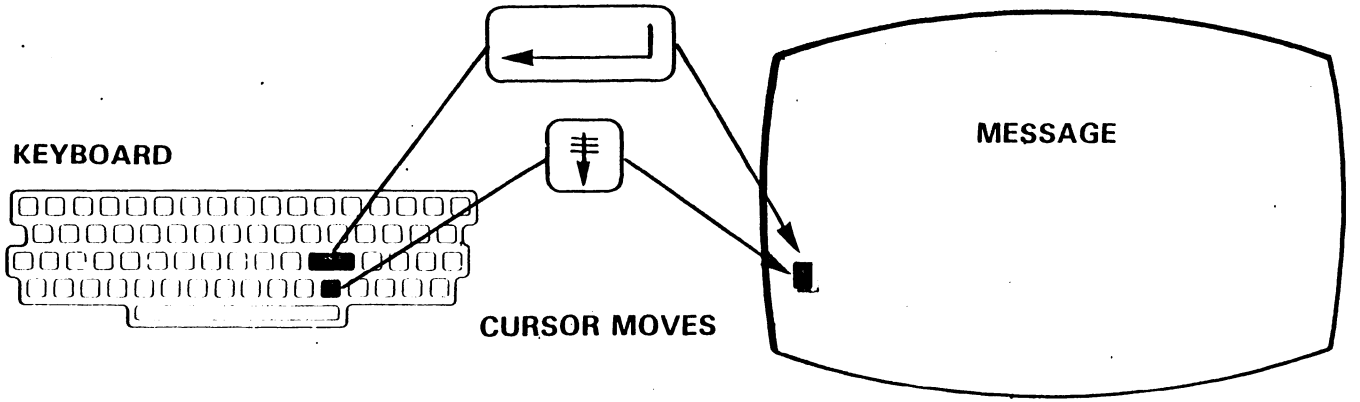
5 Type the text of the message. The message is typed on the screen and on the paper roll simultaneously.



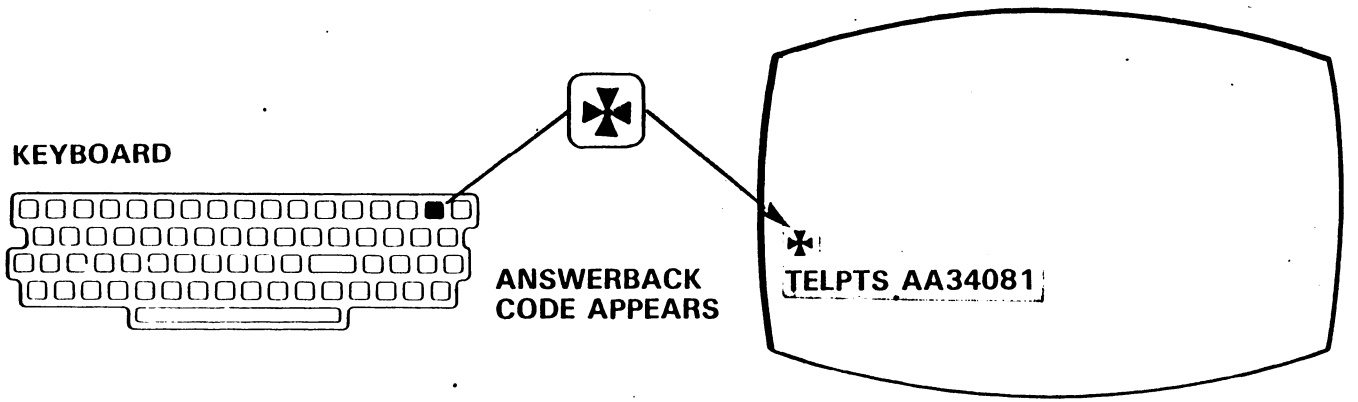
6 Press the new line key and insert five spaces with the space bar and then add the signature.



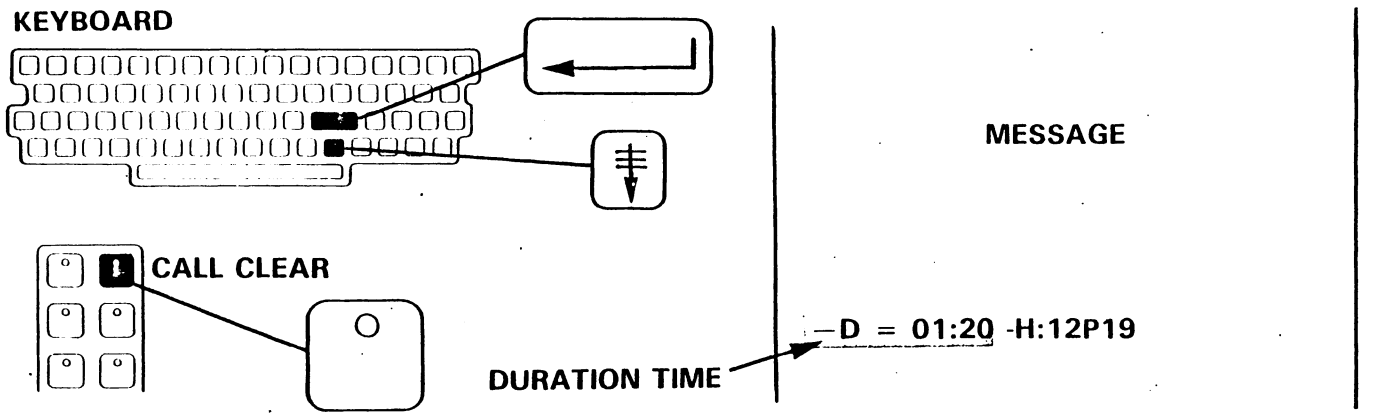
7 Press the new line and line feed keys again.



8 Press the who are you key and the answerback code of the called service appears.



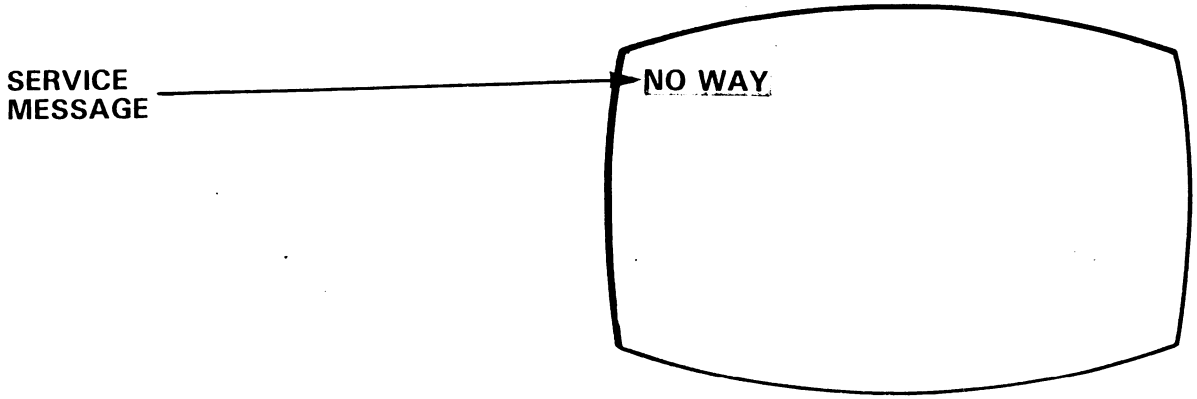
9 Press the new line and line feed keys, and the CALL/CLEAR switch. The CALL/CLEAR lamp goes out and the screen clears when the call is cleared. The connection DURATION TIME and the completion time is printed on the paper roll at the end of the message.
The message is NOT stored in memory.



SERVICE MESSAGES

Service messages are displayed on the service line of the visual display screen.

The following table explains the meaning of the service messages:



DISPLAY	MEANING
NO WAY	This log number is a message being processed or does not exist in memory LOCAL MODE. Also indicates that this message has already been transmitted if re-transmission is attempted.
UNKNOWN MESSAGE	This message identification number does not exist in memory-ON LINE MODE.
SATURATION (D)	Not enough space available in memory to store incoming message. (D indicates Disc.)
OUT OF ORDER	Teleprinter blocked due to 'out of paper' condition or printing head blocked.
ILLEGAL NUMBER	Operation requested cannot be performed with this number.
MEMORY FULL or INSUFFICIENT MEMORY	No more space available in memory. Erase messages to increase space available.
NO FREE NUMBER (D)	No free log numbers available. Erase unwanted messages. (D indicates Disc.)

CALLED MESSAGE XX	The teleprinter has recalled the message number XX.
PRINTED MESSAGE XX	The teleprinter has printed the message number XX.
ERASED MESSAGE XX	The teleprinter has erased the message number XX.
ABBREVIATED NUMBERING	You are using the abbreviated numbering table to send the called customer's number.
BREAKBACK	Reception of characters from the called customer during transmission.
RECEIVING	The teleprinter is receiving a message.
PAPER OUT	Replace the paper roll.
POWER FAILURE	The power supply has been cut.
LINE FAILURE CHECKING LINE OPEN	Report to Service Centre.
PROTECTED MESSAGE	You have used the key F* to build a protected format.
SENDING MESSAGE XXX	The message number XXX is being sent.
MESSAGE NUMBER =?	What is the number of the message to be sent?
CHECK MESSAGE NUMBER	An attempt has been made to erase a message while in PREPARATION and DISC modes.
INTERRUPTION	Transmission has stopped.

ILLEGAL SYMBOL	The message is not correctly prepared.
CALL IMPOSSIBLE	The answerback is absent or the connection is not possible.
CHECK STATUS	This message has already been transmitted.
DIALOGUE	Manual call. You may speak from the keyboard.
DISC FAILURE	The disc facility has failed.
NO DISC	There is no disc facility fitted on the teleprinter or no disc in the disc drive.
DISC ERROR	An error has been detected during transfer to disc.
MSG RECORDED IN XXD	A message has been transferred from the teleprinter memory to a disc and has the number XX on the disc.
DISC FULL	No more space is available on the disc. Erase messages or change to a new disc.

ABBREVIATIONS

To facilitate speedy transmission, various abbreviations may be used during calls to a called customer or Telex exchanges. The abbreviations shown on this table may be used during calls made WITHIN AUSTRALIA ONLY.

ABBREVIATION	MEANING
A/B	Answerback
ABFF	Answerback format faulty
	Call Service Centre
ADC	Advise duration and charge
BCAST	Broadcast call
BK	Incorrect selection information or timeout between characters
CCL	Cancel call please
CFCE	Conference call
CON	Connect, connected, connecting (as appropriate)

FIN	Finish, finished
INTLX	International teleprinter exchange
OPR	Operator
OTC	Overseas Telecommunications Commission (Australia)
PGM	Printergrams
PLS	Please
PP	Particular person
PPU	Particular person not available
TKS	Thanks
WCU	Will call you shortly in about ..... minutes

AUSTRALIAN AND INTERNATIONAL CALLS

The abbreviations shown in this table are recognised internationally and may be used or encountered during calls made in Australia or during international calls.

*NOTE: The Service Code NC is sometimes preceded on the previous line by a single character. This indicates to technical staff the area of the call failure.

ABBREVIATION	MEANING
ABS	Absent customer/office closed
ANUL	Delete
BK	I cut off
CFM	Confirm
CLG	Calling
COL	Collation please/I collate
CRV	How do you receive? I receive well
DER	Out of order
DF	You are in communication with the called TELEX service
GA	Go ahead/you may transmit
INF	Customer temporarily unobtainable, call the Information Service
IFE	Office closed because of holiday
MNS	Minutes
MOM	Wait a moment please
MUT	Mutilation
N A	Correspondence to this international destination is not admitted
NA	Correspondence to this service is not admitted
*NC	No circuits or equipment (try again later)
N C	No international circuits or equipment (try again later)
NCH	Customer's number has been changed
NI	No line identification available

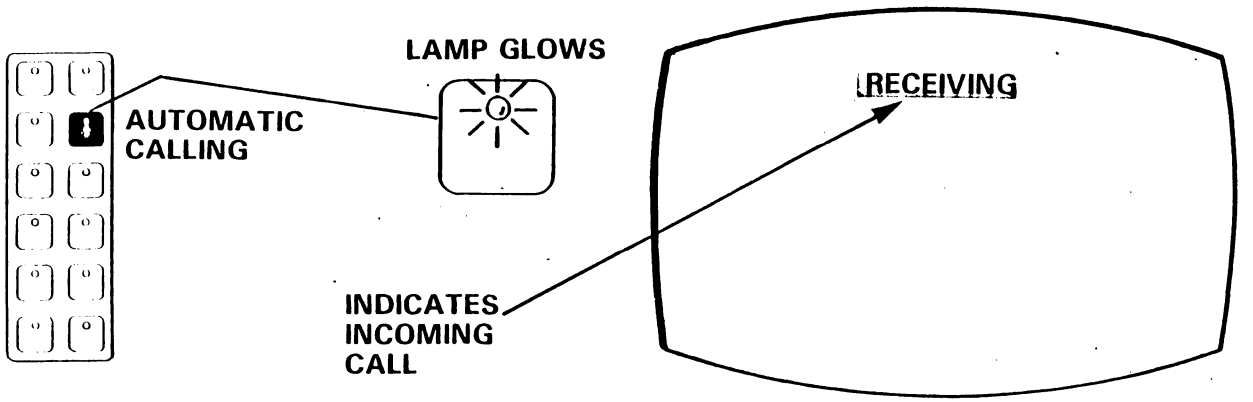
NP	The called number is not, or is no longer a Telex service
NR	Indicate your number/My number is
OCC	Call service occupied (engaged)
OK	Agreed/do you agree
PPPP	Stop Transmission
PPR	Paper
R	Received
RAP	I shall call you back
RPT	Repeat/I repeat
SSSS	Here ready for data transmission
SVP	Please
TAX	What is the charge/The charge is .....
TESTMSG	Please send a test message
THRU	You are in communication with a Telex position
TPR	Teleprinter
W	Words
WRU	Who are you?
XXXXX	Error
+ +	End of transmission acknowledgement not required
+ ?	End of transmission, you may transmit.

RECEIVING CALLS

Incoming calls may be recorded on the printer only, or recorded on the printer and in the memory. To route incoming calls to the memory, see Section 6 (refer to page 79).

INCOMING CALLS TO PRINTER ONLY, OR PRINTER AND MEMORY, IF REQUIRED

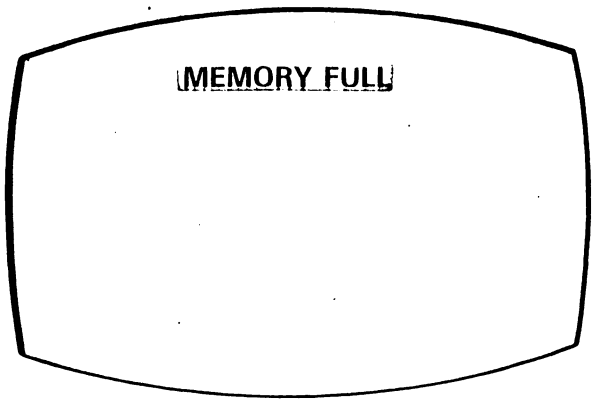
Incoming calls cause the AUTOMATIC CALLING lamp to come on and the service line on the visual display screen indicates RECEIVING. The visual display screen may be used to prepare messages during receipt of incoming calls.



When in the memorise mode, the machine stores each incoming message in the memory and prints the receive information number and duration after each incoming call. This message appears in the log and may be displayed at any time.

If the memory is filled during reception, the incoming call appears on the Printer only. MEMORY FULL appears on the service line of the visual display screen. Some of the memory contents must be erased before the machine can be used to prepare and store new messages.

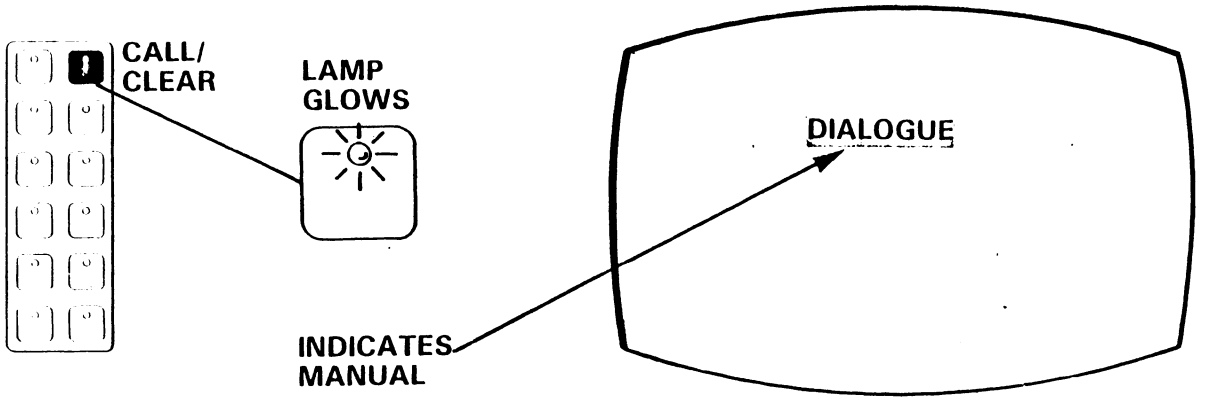
The printed line log will print the code CSM, indicating that the message in store should be checked for completeness.



INTERRUPTING AN INCOMING CALL

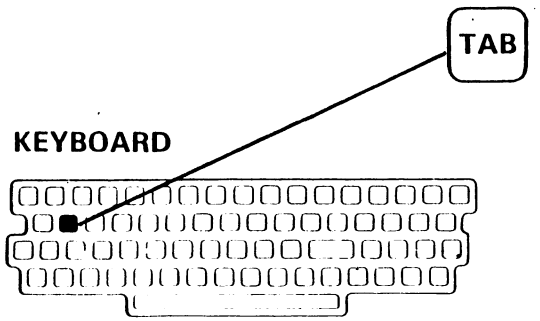
If necessary, an incoming call may be interrupted:

1. Press the CALL/CLEAR switch. This causes the AUTOMATIC CALLING lamp to go out and the CALL/CLEAR lamp to glow.

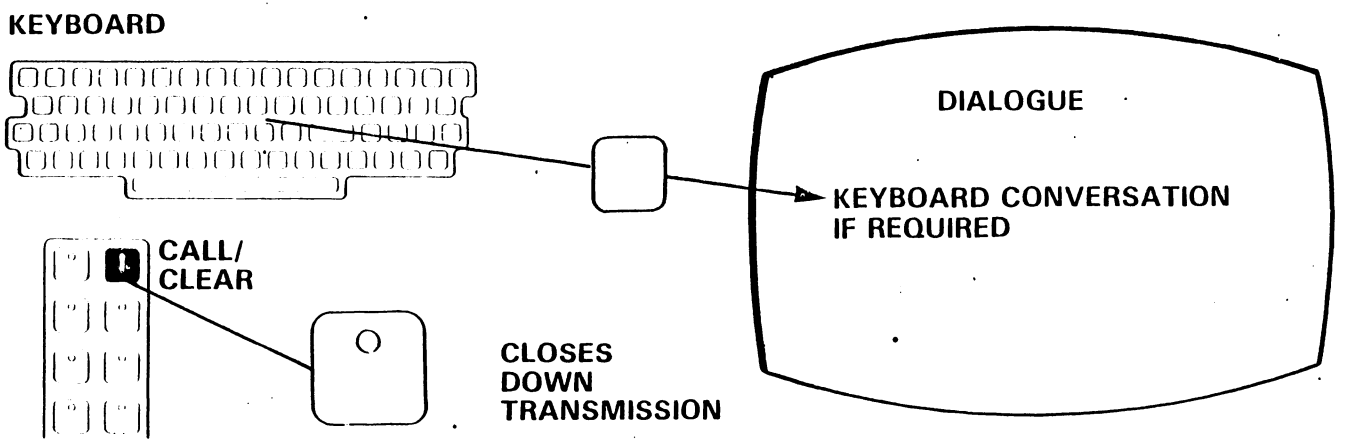


2. Press the TAB key. This action stops receipt of an automatic transmission. If an operator is sending manually, keep pressing the TAB key until the transmission stops.

NOTE: If the keyboard locks, press the unlock key.



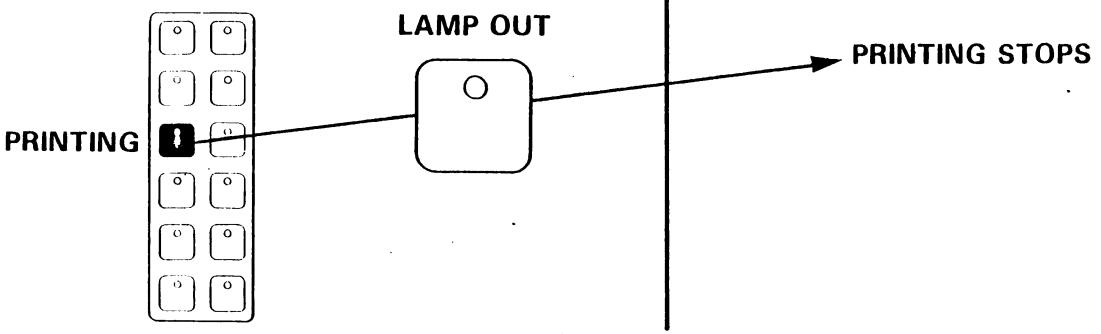
3. If required, you may now use the keyboard to converse with the sending operator. If there is no operator present, press the CALL/CLEAR switch to close down the transmission.



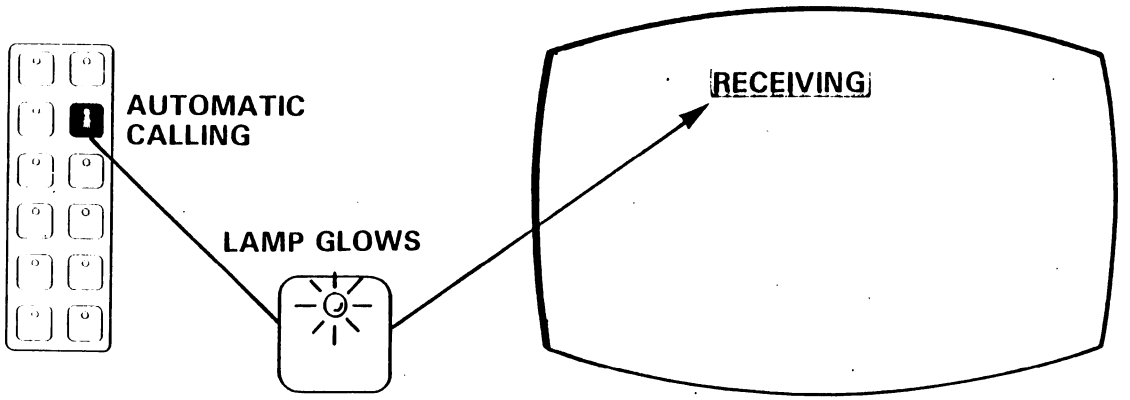
RECEIVING A MESSAGE WHILST PRINTING LOCALLY

If a message is received whilst the teleprinter is printing locally:

The PRINTING lamp goes out, and the printer stops.



The AUTOMATIC CALLING lamp glows and RECEIVING is displayed on the service line of the visual display screen.



The incoming call is printed on the paper roll. When the transmission is completed, the AUTOMATIC CALLING lamp goes out. The local printing operation may now be resumed from the beginning.

INCOMING CALL NOW
PRINTED

The contents of the teleprinter memory may be displayed on the visual display screen.

MESSAGE DISPLAY

A prepared, transmitted or received message stored in the memory may be displayed on the visual display screen. as follows:

MESSAGE LOG

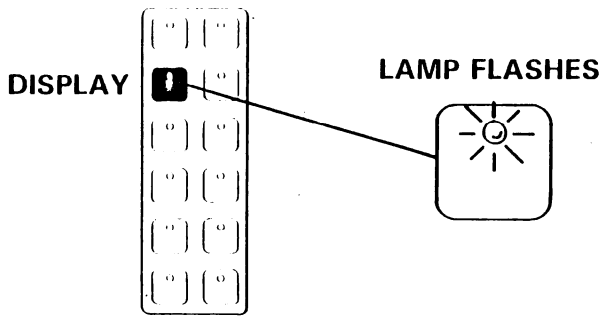
The teleprinter also contains a message log which lists details of all messages stored in the memory. The lists may be displayed by typing the log numbers 00, 98 or 99.

The log displays all details contained in the message address lines, plus the identification number, status, the telex number, the time, the number of memory blocks and the message label.

00	ALL MESSAGES
98	TRANSMITTED MESSAGES
99	RECEIVED MESSAGES

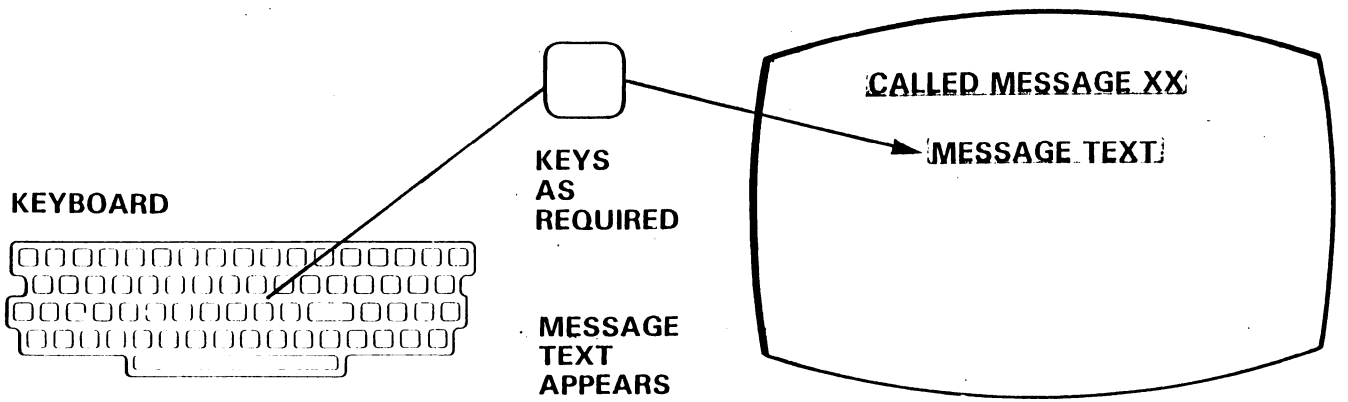
TO DISPLAY A MESSAGE

1. Press the DISPLAY switch.



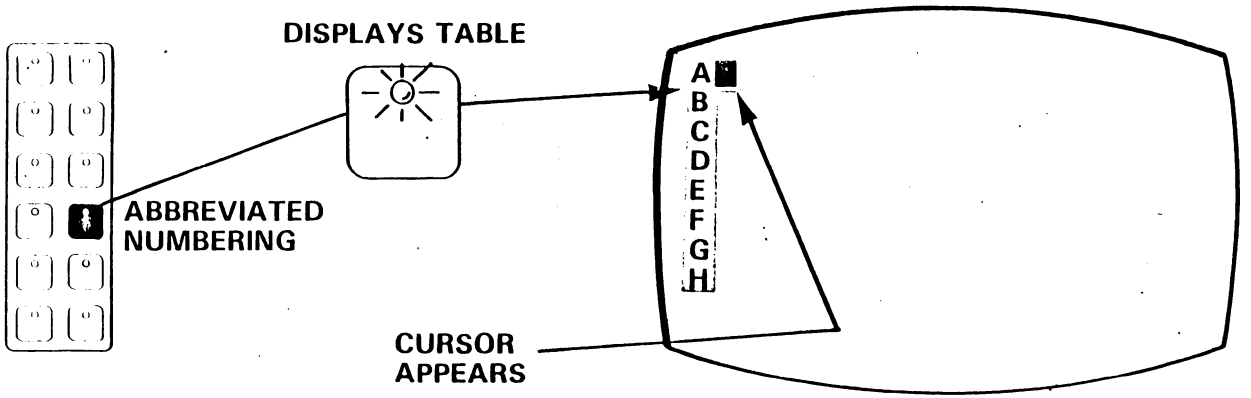
2. Type the log number of the message to be displayed.

NOTE: Message log numbers will be in the range from 01 to 97.

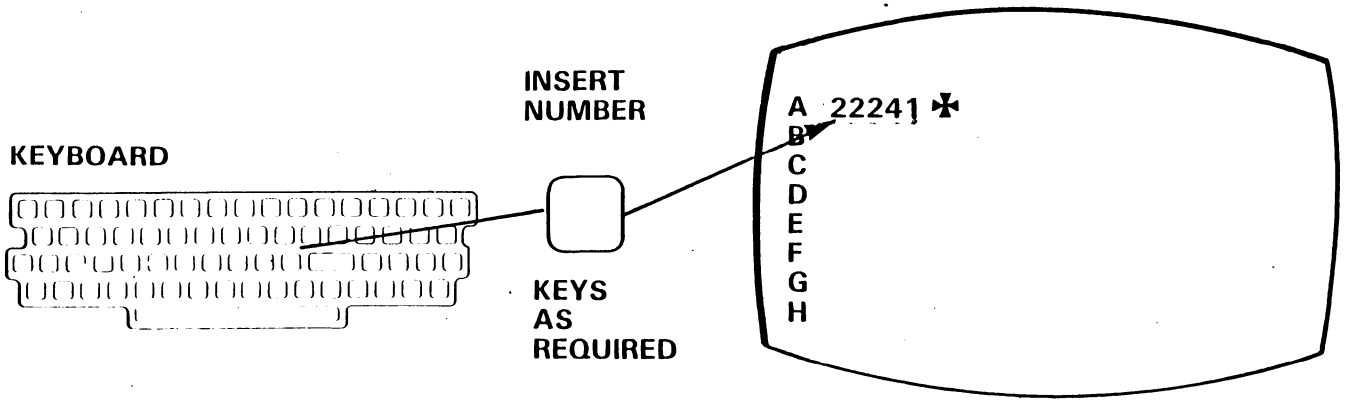


You may store up to 20 customer's numbers in the abbreviated numbering table. Each number is represented by a single letter from A to T. To store numbers in the abbreviated numbering table:

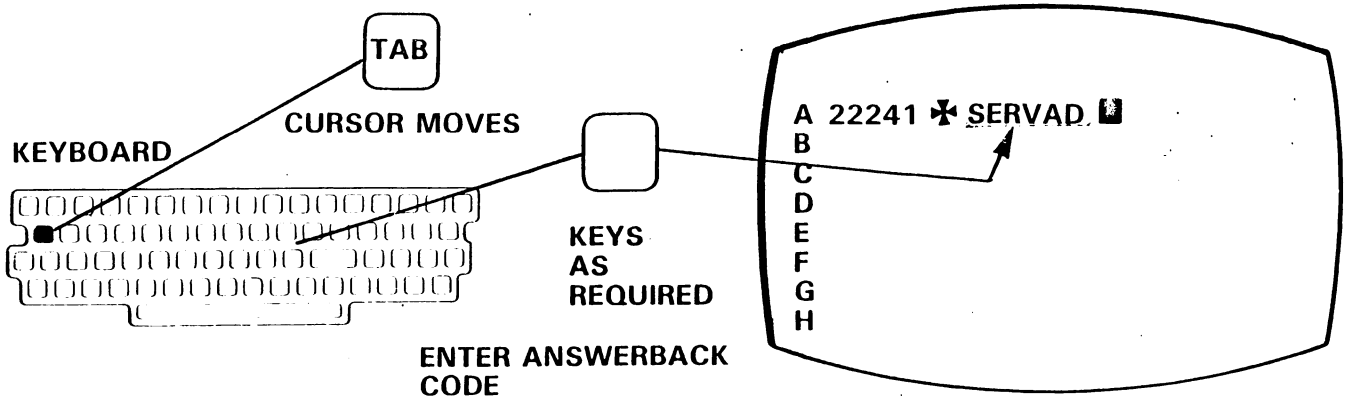
1. Press the ABBREVIATED NUMBERING switch. The visual display screen displays the table. The cursor appears on the first entry position available.



2. Type the customer's number.

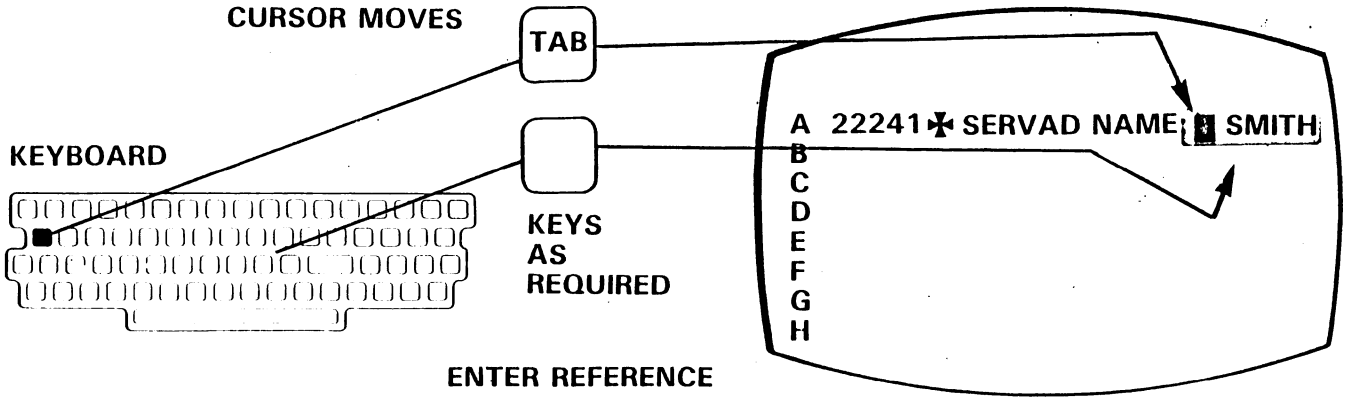


3. Press the TAB key. If required, enter the answerback code of the wanted customer's number.

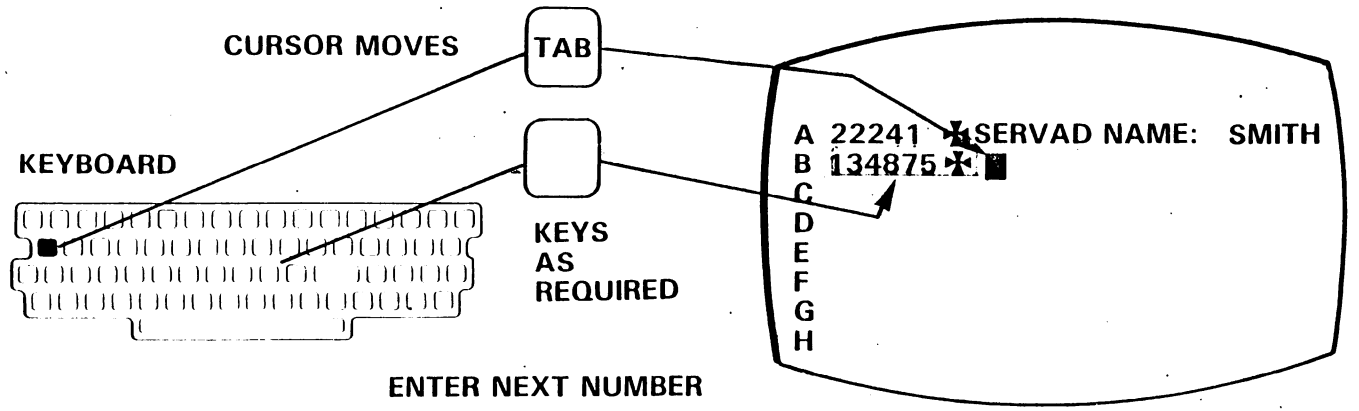


4 Press the TAB key again, then enter your own reference details.

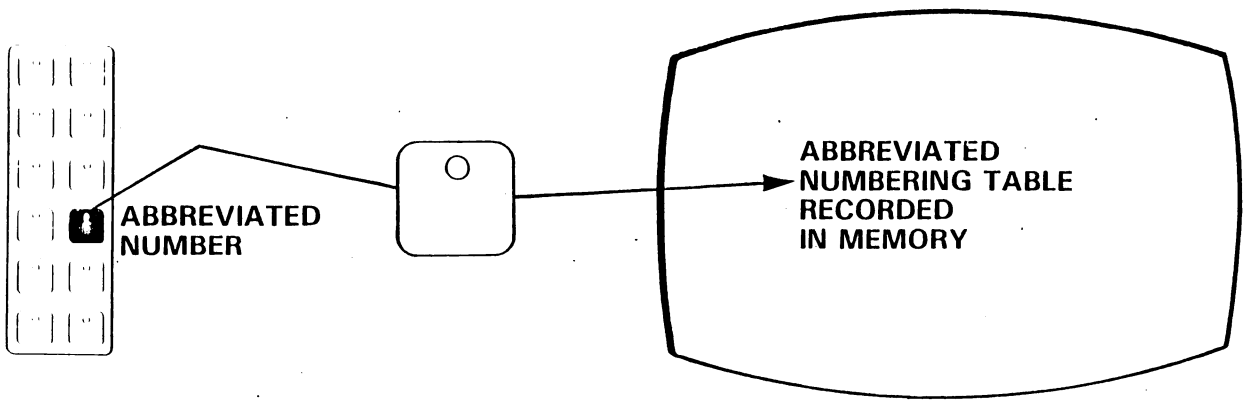
NOTE: If the erase line key is pressed, the entire line of the display on which the cursor is standing will be erased.



5 Press the TAB key again, and enter details of the next number. Repeat entries as required.



6 Press the ABBREVIATED NUMBERING switch again. The display vanishes and the abbreviated numbering table is recorded in the memory.

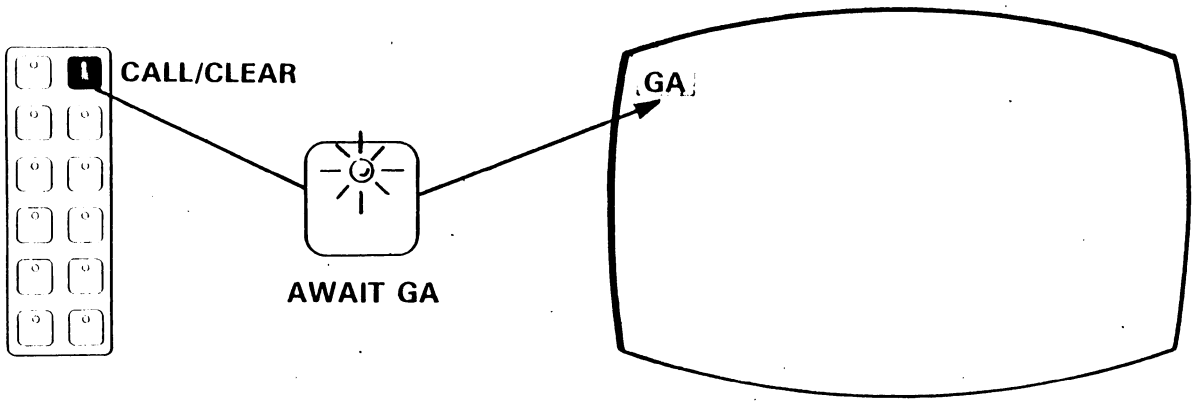


You may use the abbreviated number table to transmit a full customer's number by the operation of a single key.

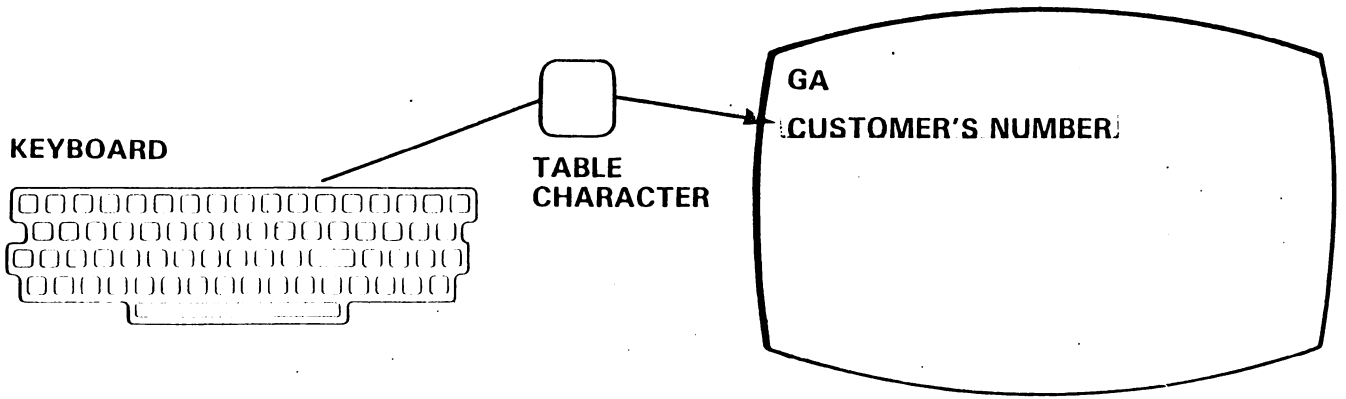
CALLING MANUALLY

When calling manually:

1. Press the CALL/CLEAR switch and wait until GA appears on the visual display screen.



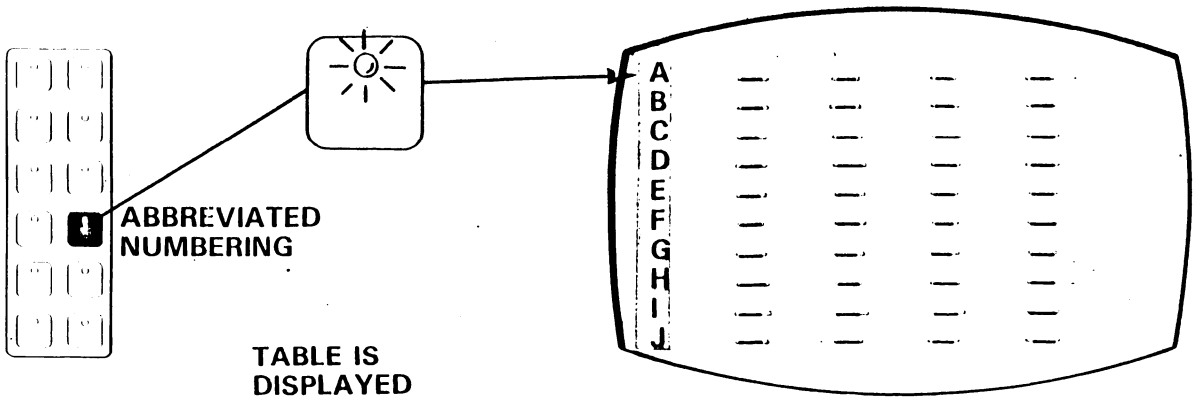
2. Type the single table character of the wanted customer's number. The full number is transmitted, printed on the paper roll and displayed on the visual display screen.



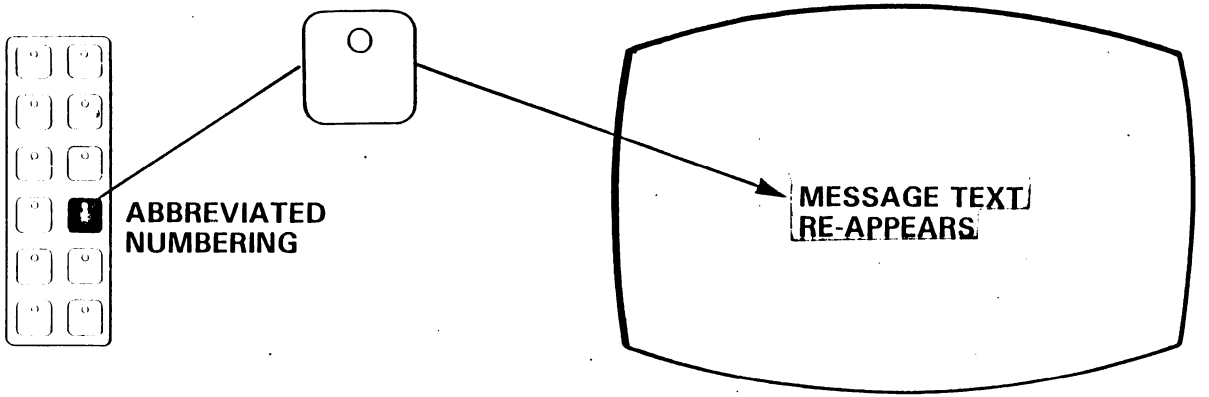
AUTOMATIC TRANSMISSION

You may use the abbreviated number table when preparing a message for automatic transmission. After preparing the message, and whilst it is still displayed on the visual display screen:

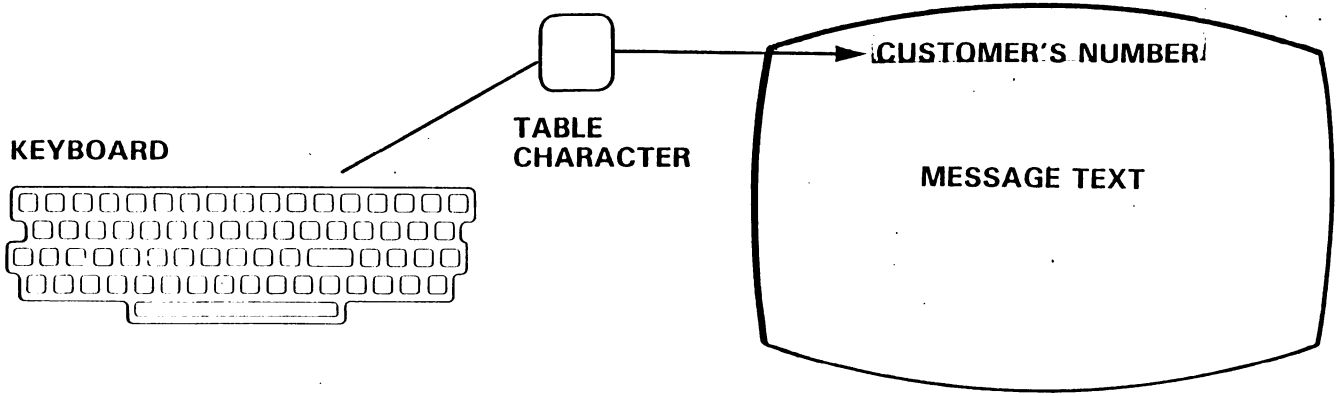
1. Press the ABBREVIATED NUMBERING switch.



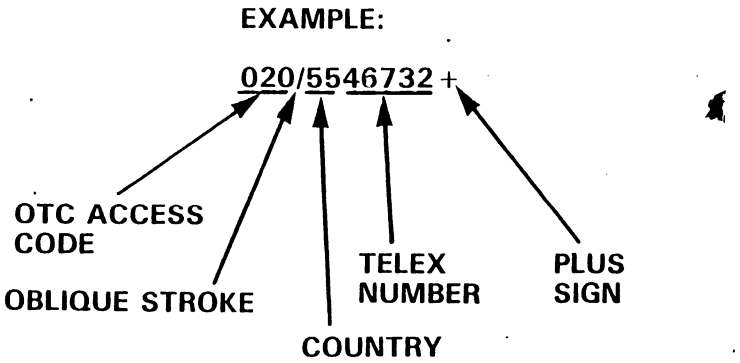
2. Note the table character of the wanted customer's number and then press the ABBREVIATED NUMBERING switch.



3. Type the single table character of the wanted customer's number in the wanted number field. The full Telex number appears in the service line of the visual display screen.



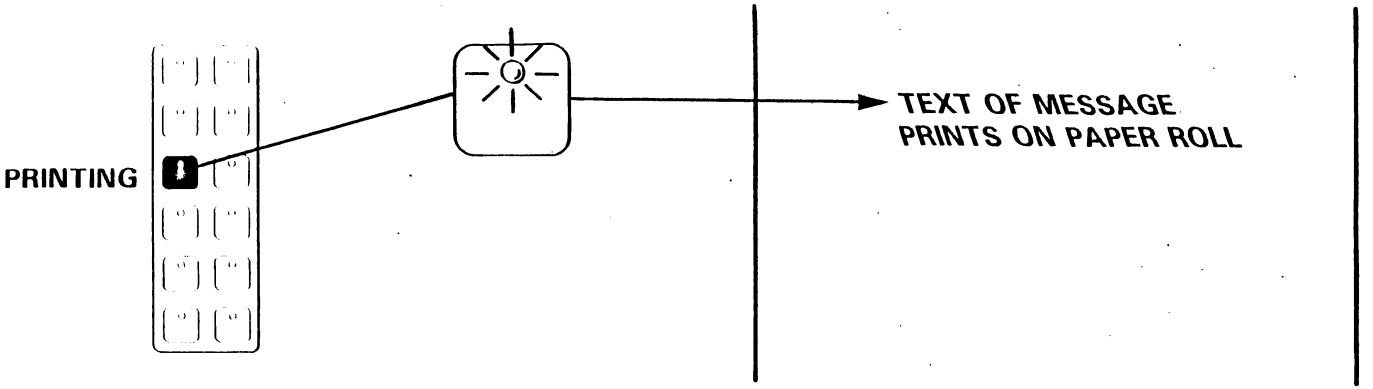
NOTE: Abbreviated numbering may be used for international calls. Enter the OTC access code followed by an oblique stroke, the country of destination code, the wanted Telex number and a plus sign in the abbreviated numbering table.



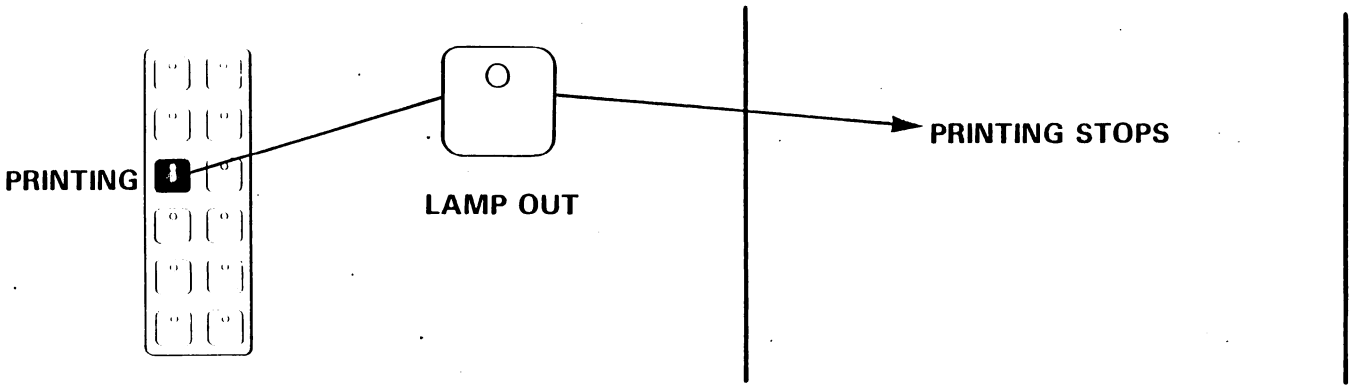
LOCAL PRINTING FROM THE VISUAL DISPLAY SCREEN

The text of a message may be printed during or after preparation. To print the text of a message from the visual display screen:

1. Press the PRINTING switch.



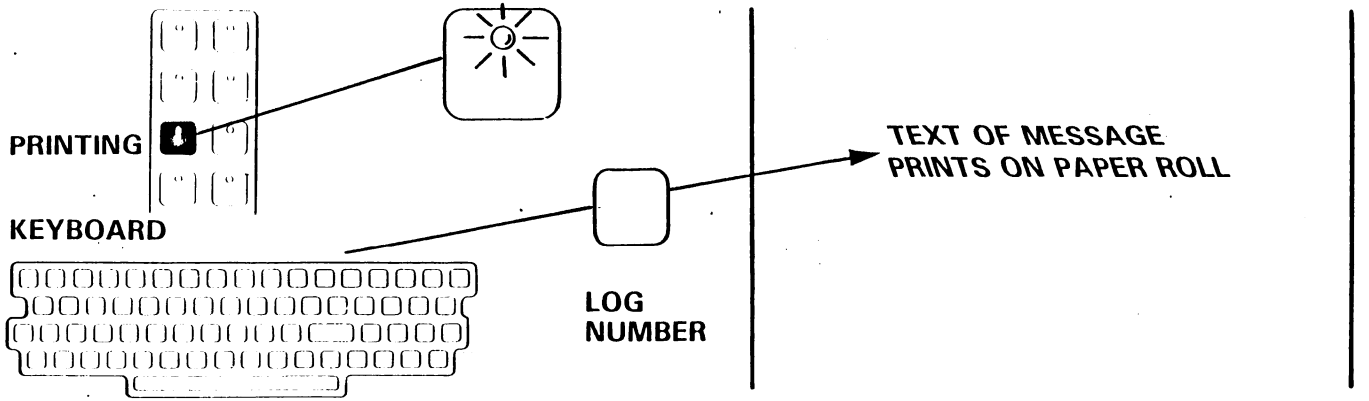
2. If the whole message is printed, the printing lamp goes out on completion. To stop printing before the entire text is printed, press the PRINTING switch again.



PRINTING FROM THE MEMORY

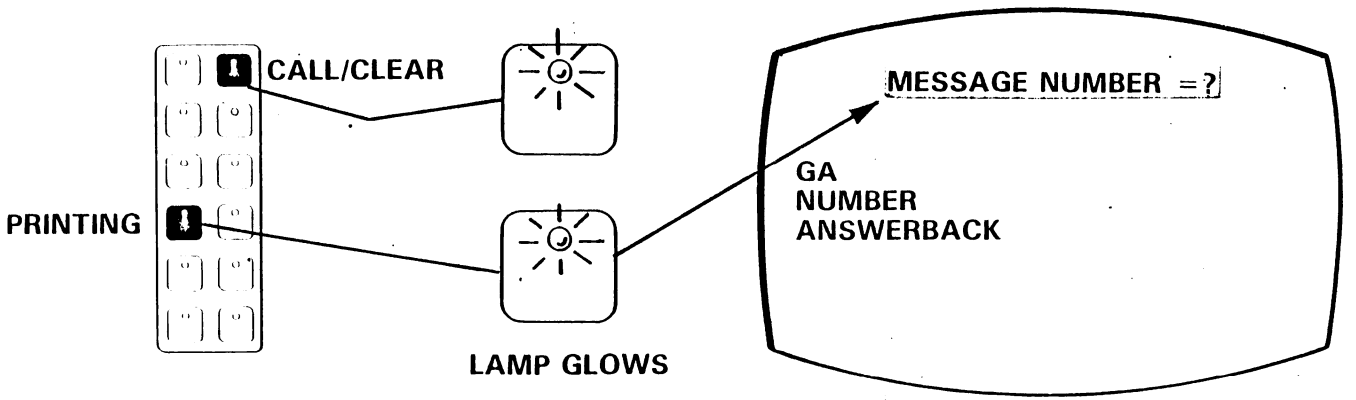
To print a stored message locally:

- Press the PRINTING switch and type the log number.

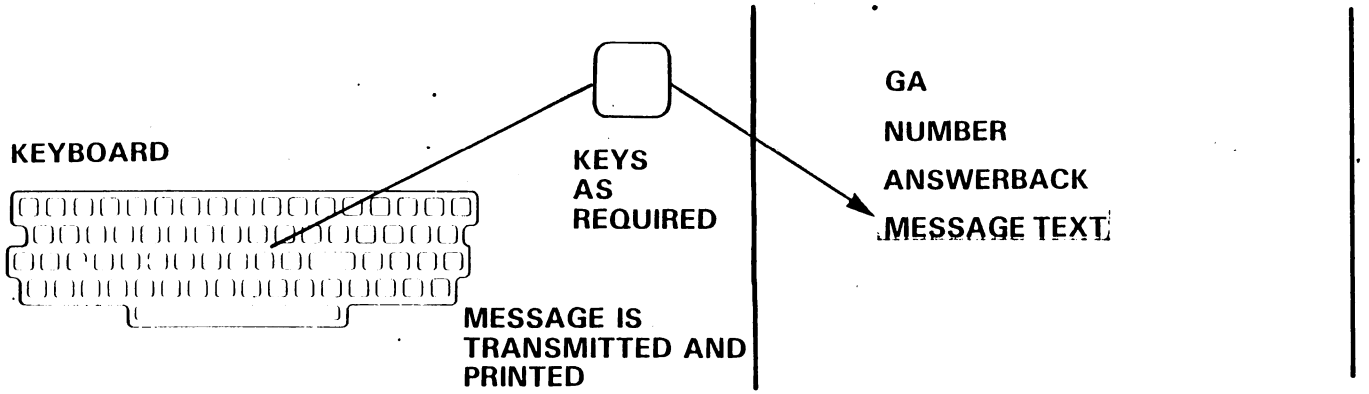


To transmit a stored message using the printing function:

1. Establish the call manually and press the PRINTING switch.



2. Type the identification number of the message to be transmitted.

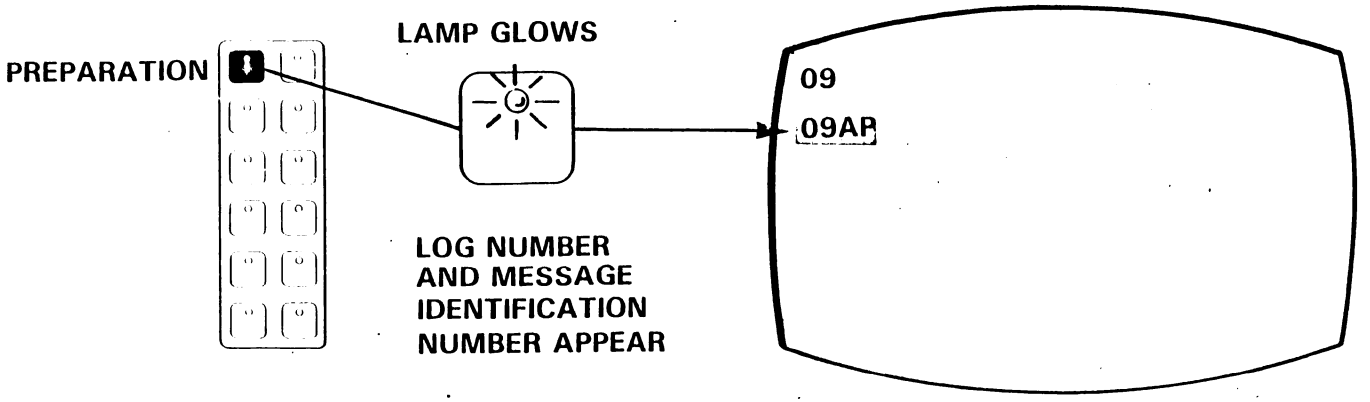


MESSAGE DUPLICATION

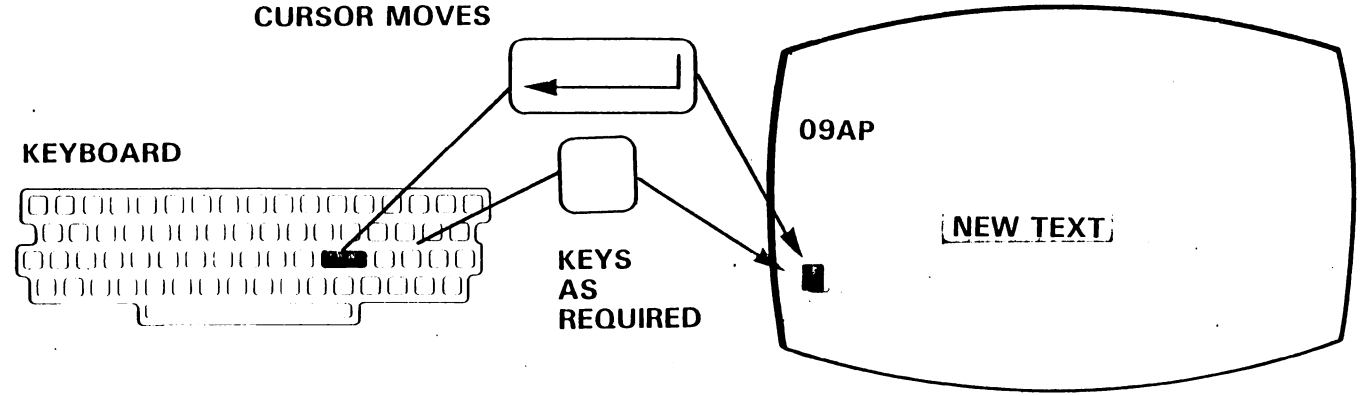
Messages which are stored in the memory may be recalled to the visual display screen for use in part or wholly in the preparation of a new message.

To duplicate a stored message:

1. Press the PREPARATION switch.

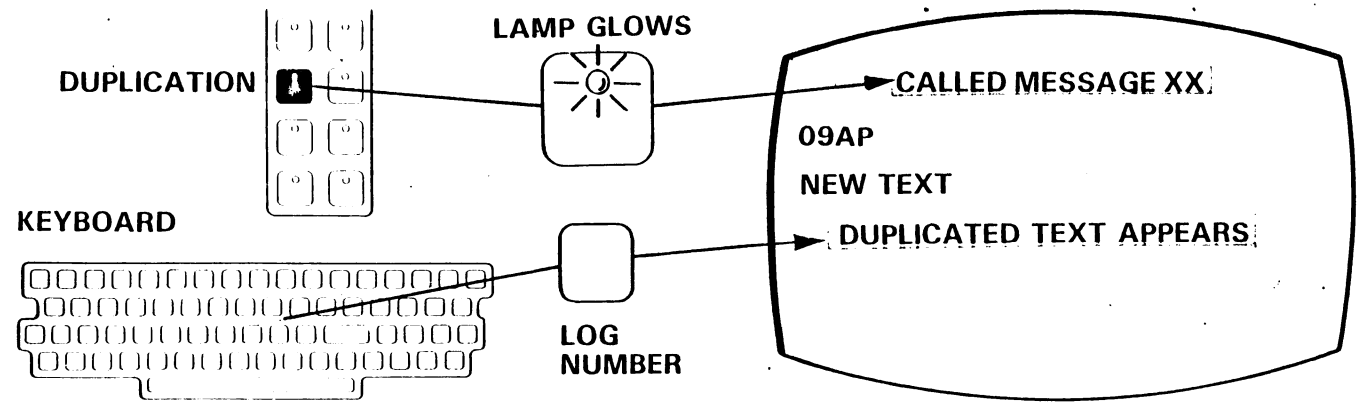


2. Type new text, then press the new line key.



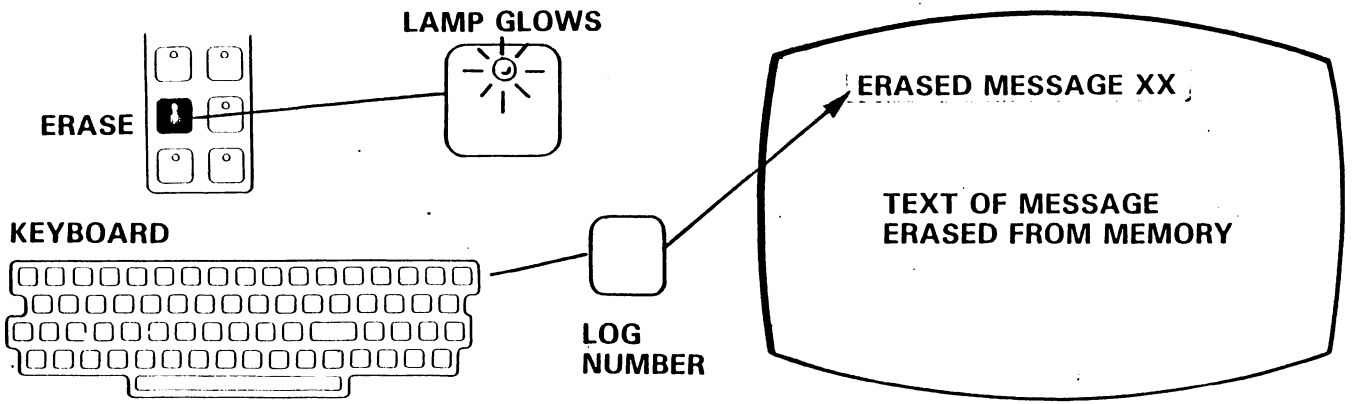
3. Press the DUPLICATION switch and type log number of message to be duplicated.

NOTE: Prepared (P) messages that have been stored may be returned to the PREPARATION mode by first displaying the message (DISPLAY XX) and then pressing the PREPARATION switch.



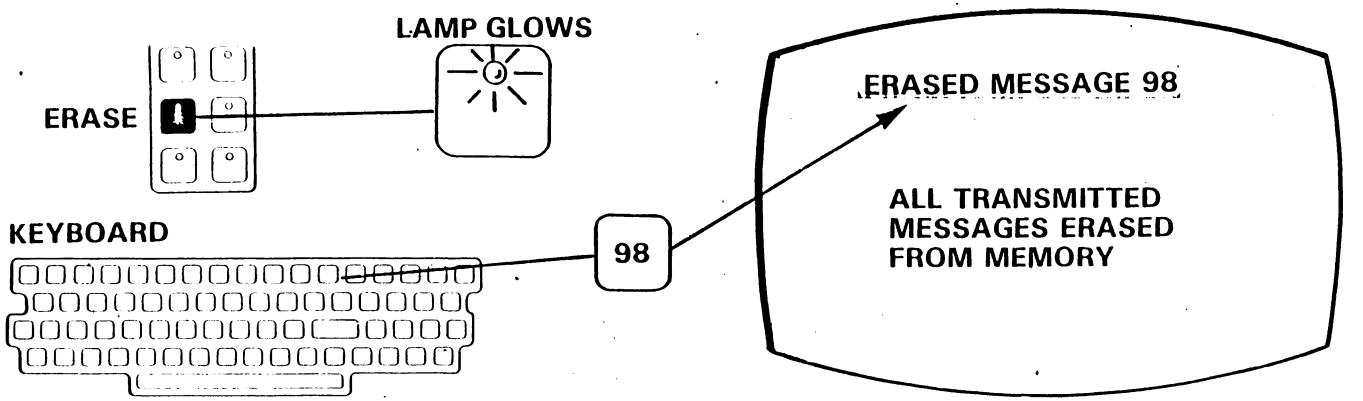
Unwanted messages or groups of messages may be erased from the memory to restore its storage capacity. To erase a message:

- Display the message by pressing the DISPLAY switch and typing the log number.
- Press the ERASE switch and type the log number of the message.



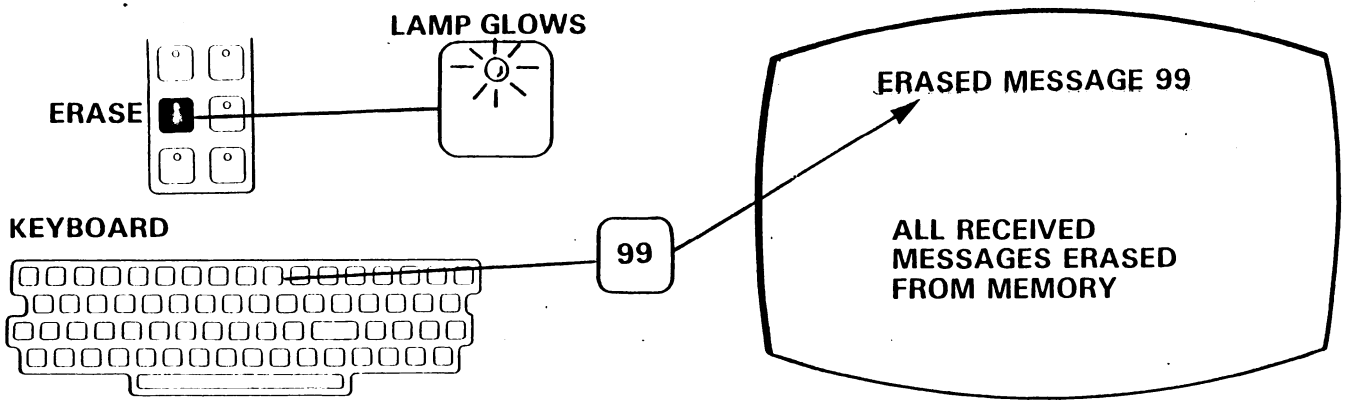
If required, messages may be erased in groups. To erase all transmitted messages in the memory:

- Display the log by pressing the DISPLAY switch and typing 98.
- Press the ERASE switch, and then type the code 98.



To erase all received messages in the memory:

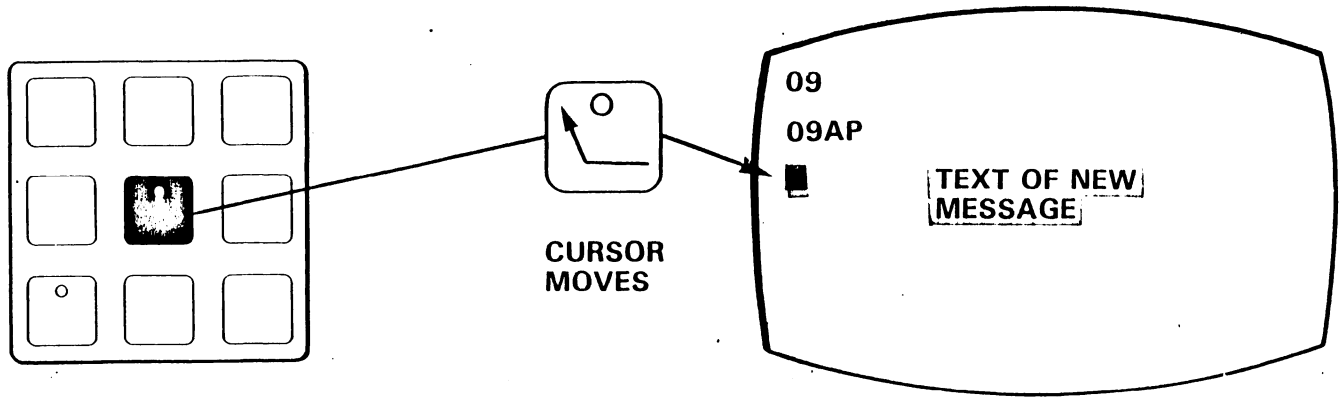
- Display the log by pressing the DISPLAY switch and typing 99.
- Press the ERASE key, and then type the code 99.



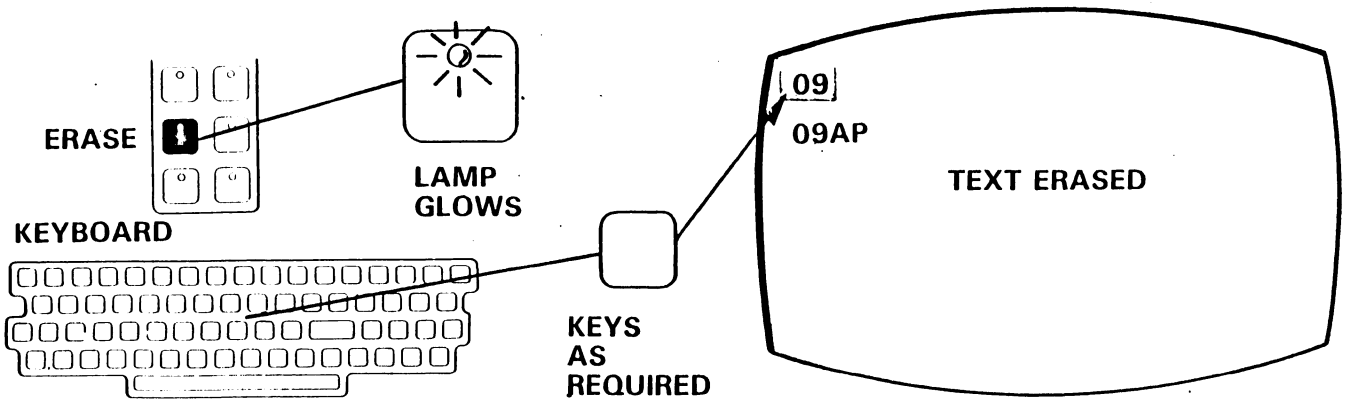
ERASING MESSAGES DURING PREPARATION

You may erase the full text of a new message during preparation:

1. Move the cursor to the home position.



2. Press the ERASE switch and type the log number of the message.



MESSAGE TABULATION

Two types of tabulation are available to prepare elements of a message in a tabulated format:

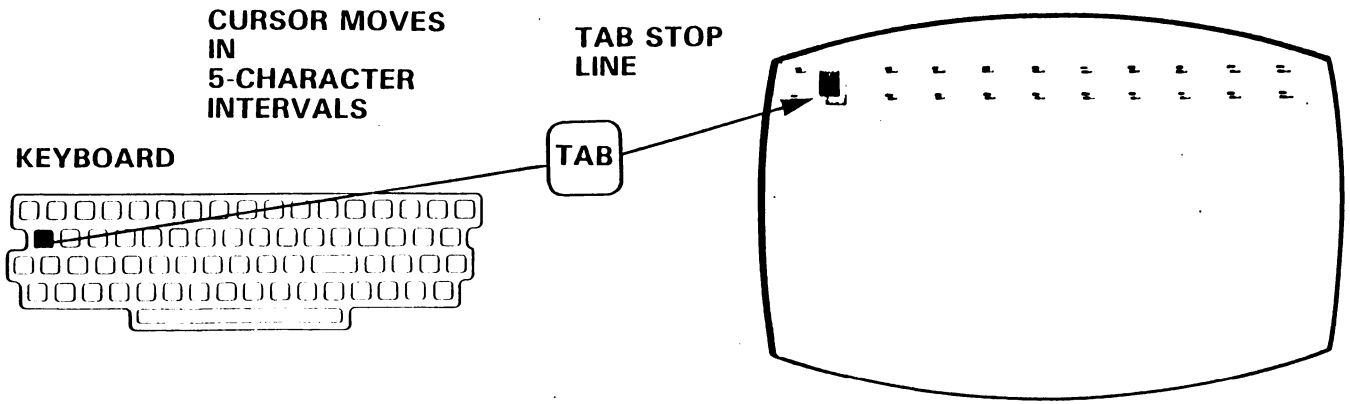
- Automatic tabulation — Similar to a typewriter
- Selective tabulation — Allows tab stops to be set selectively during message preparation.

SET BY TAB STOPS ON 2ND LINE OF SCREEN

OVERRIDES AUTOMATIC TABULATION

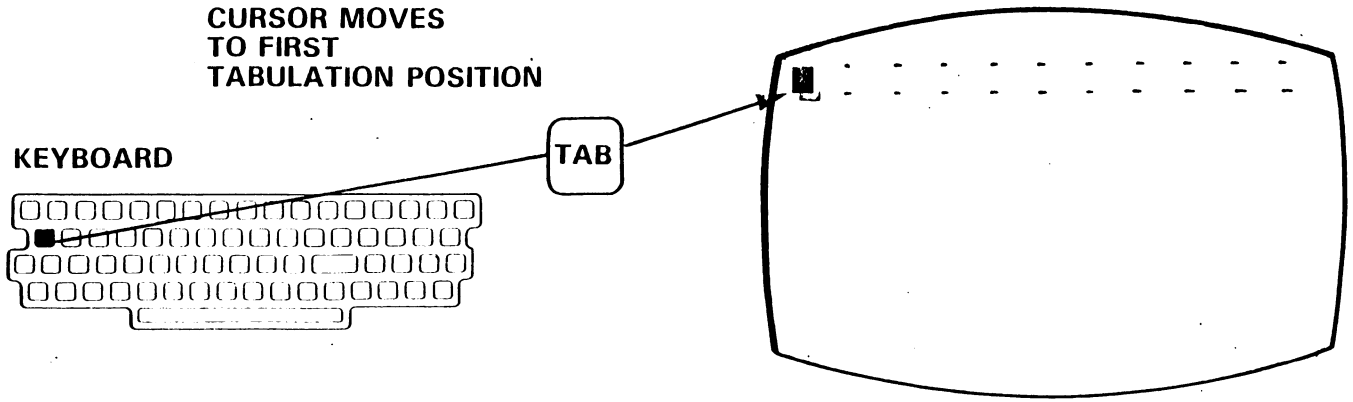
AUTOMATIC TABULATION

The tab stop line on the visual display screen may be set to provide any desired tabulation for use on any part of the visual display screen. As installed, the tab stop line sets in five character intervals. The tab position is indicated by a colon.

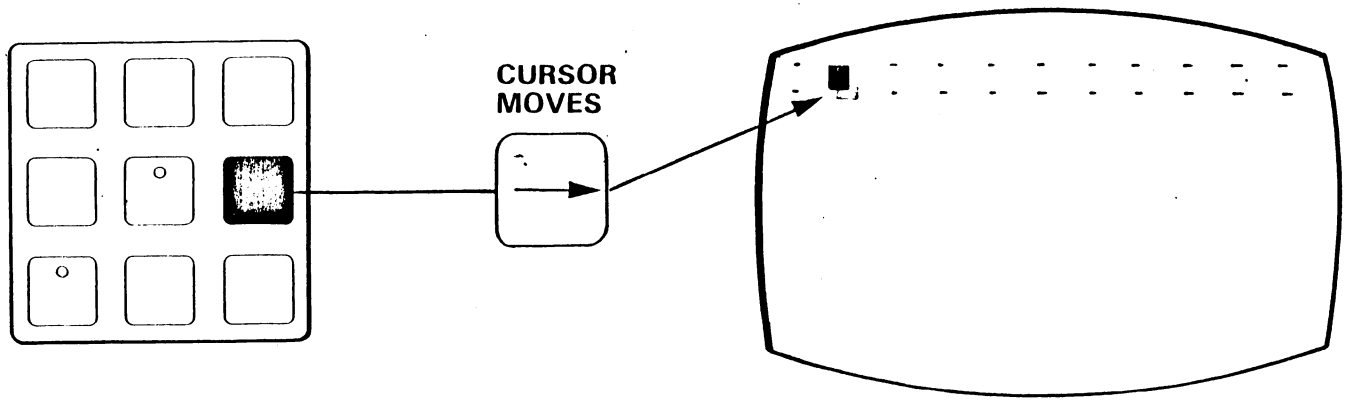


You may change this configuration. To change the tabulation:

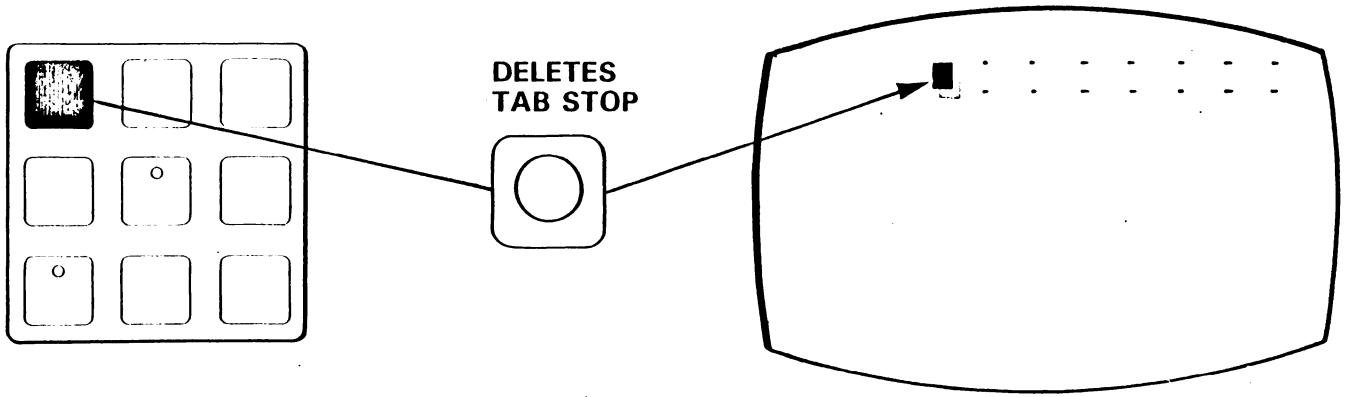
1. With the teleprinter in an idle mode (not standby, but with no operation switches pressed), press the TAB key.



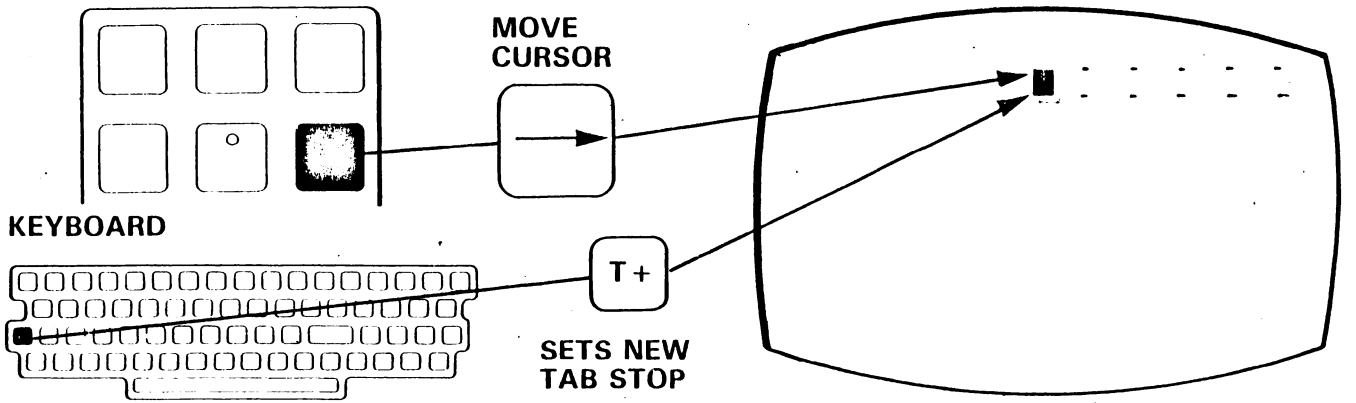
2 Move the cursor to the next tabulation position shown on the tab stop line.



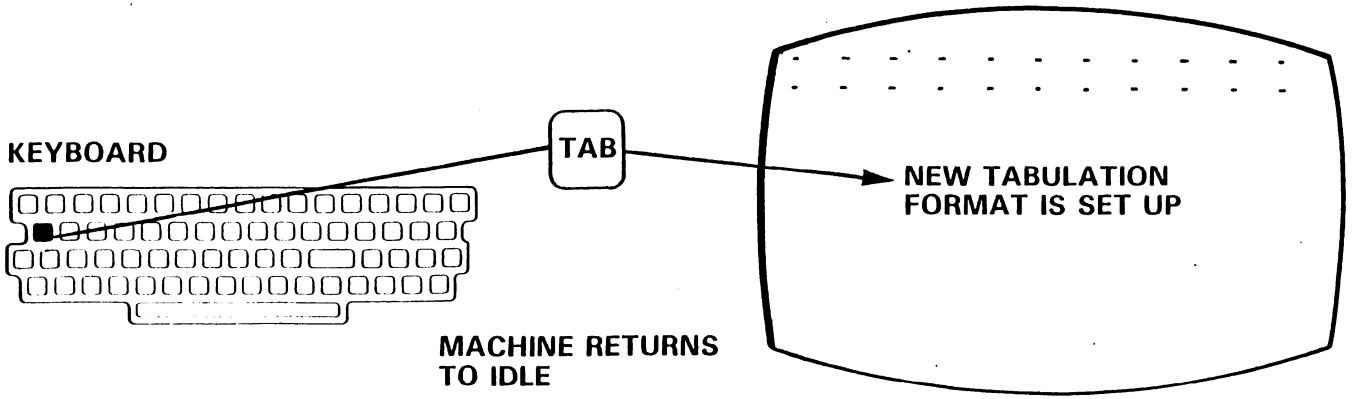
3 Delete this tabulation position by pressing the delete character key.



4 Move the cursor to the desired new tabulation position and operate T+ key to set a new tab stop. Repeat this procedure as required.



5 Press the TAB key again to restore the machine to an idle status.



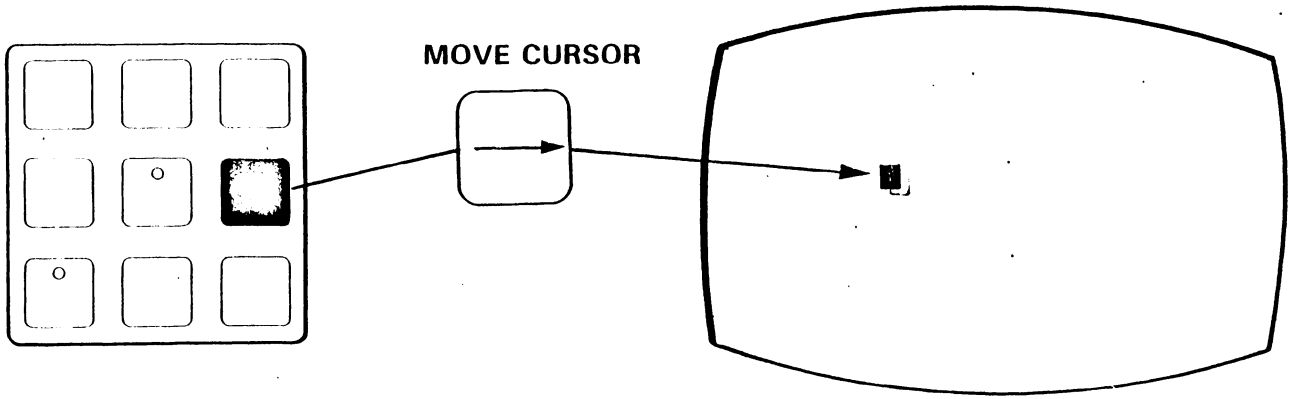
The tabulation facility is now set up. Operate the TAB key at any time you require it and the cursor is moved to the next tab setting. The tab position indicators (:) are not displayed in the text or transmitted.

SELECTIVE TABULATION

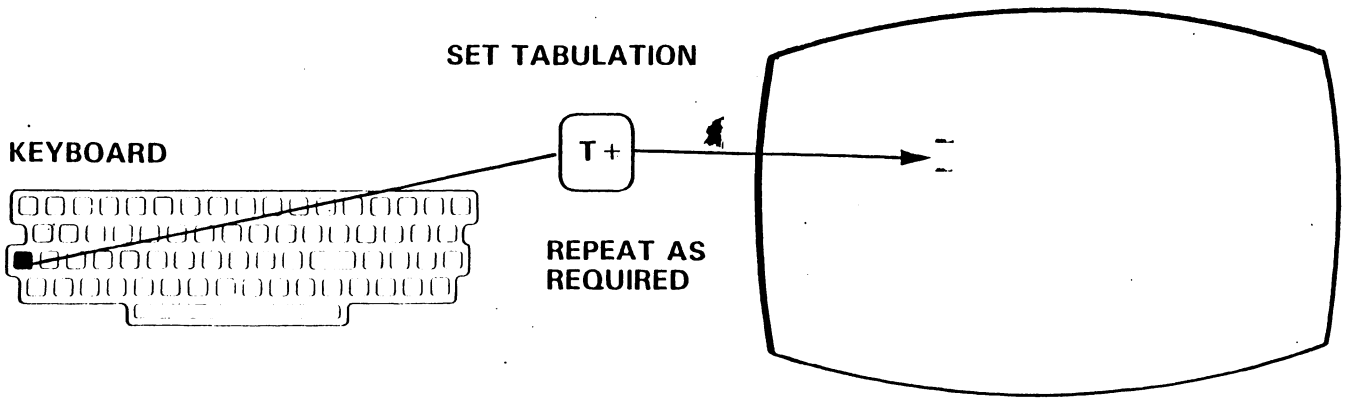
The tabulation format may be set up individually for each message whilst preparing a message. The tab stops set on any line are repeated on the following lines each time the new line key is pressed.

To set selective tabulation during preparation:

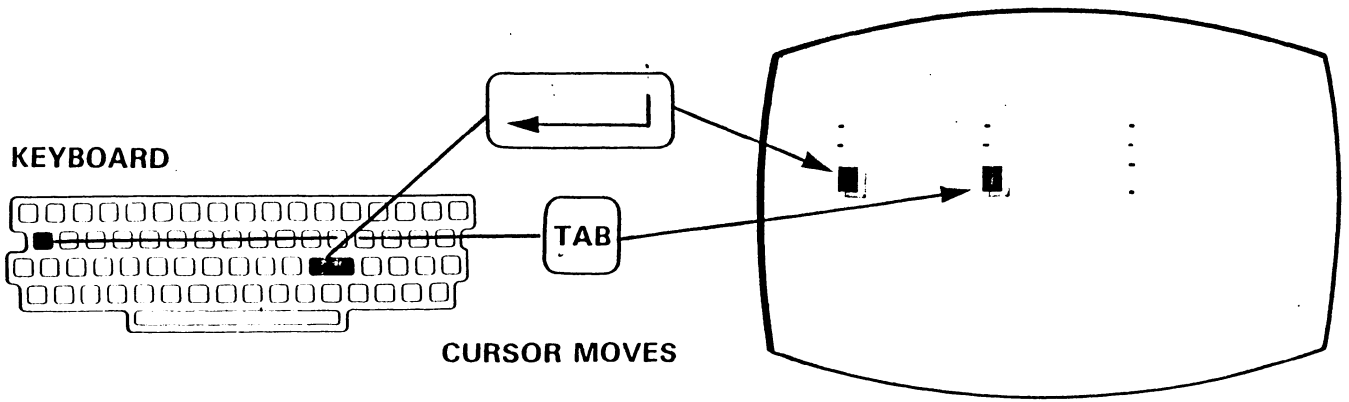
1. Move the cursor to the position on a line where the tabulation is required.



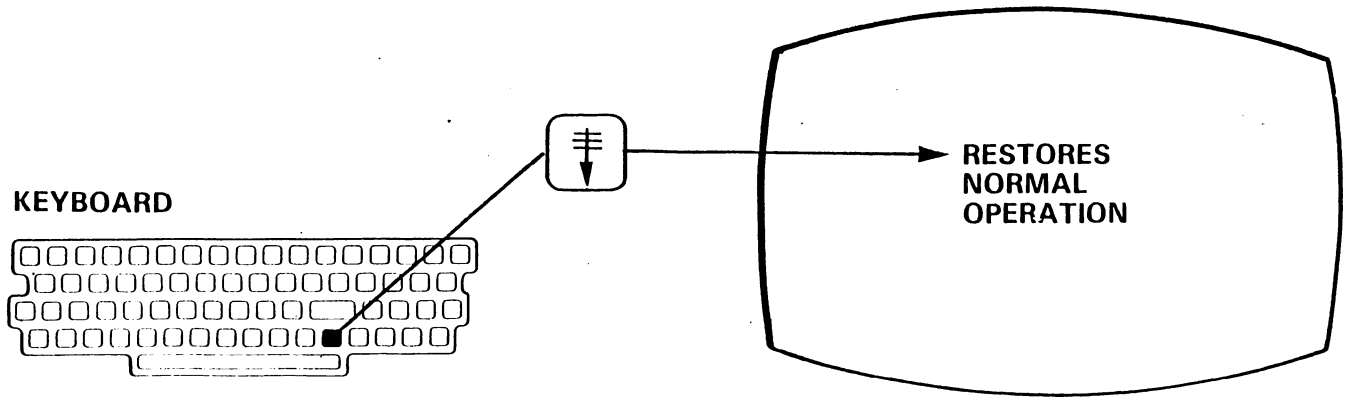
2. Press the T + key. A colon appears at that position. Repeat these two steps to set other tab positions.



3. Press the new line key and the set tab positions will be available on the new line. Press the TAB key to move the cursor to tab positions.



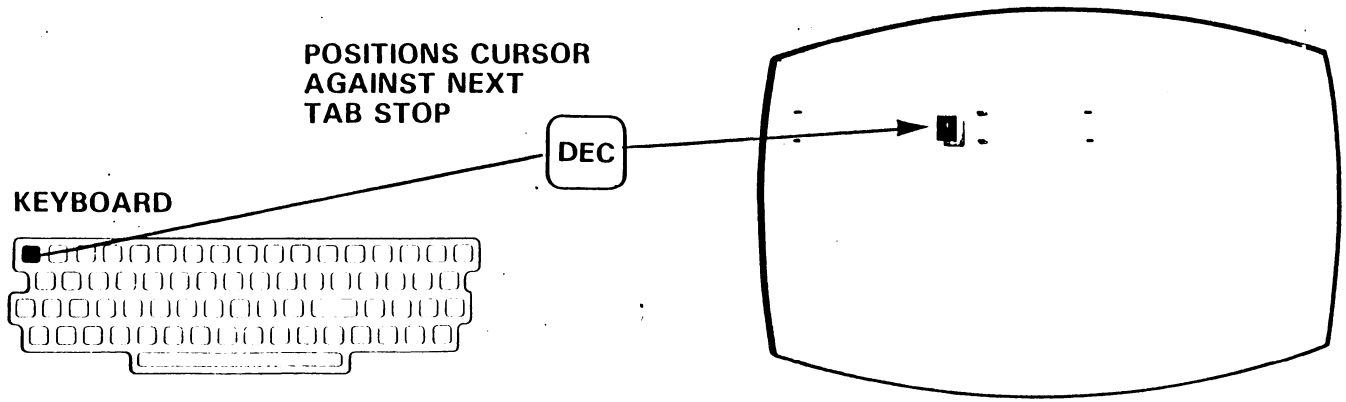
4. After tabulation is complete, press the line feed key to restore normal operation.



DECREMENT TABULATION (Inserting information from right to left in a tab field).

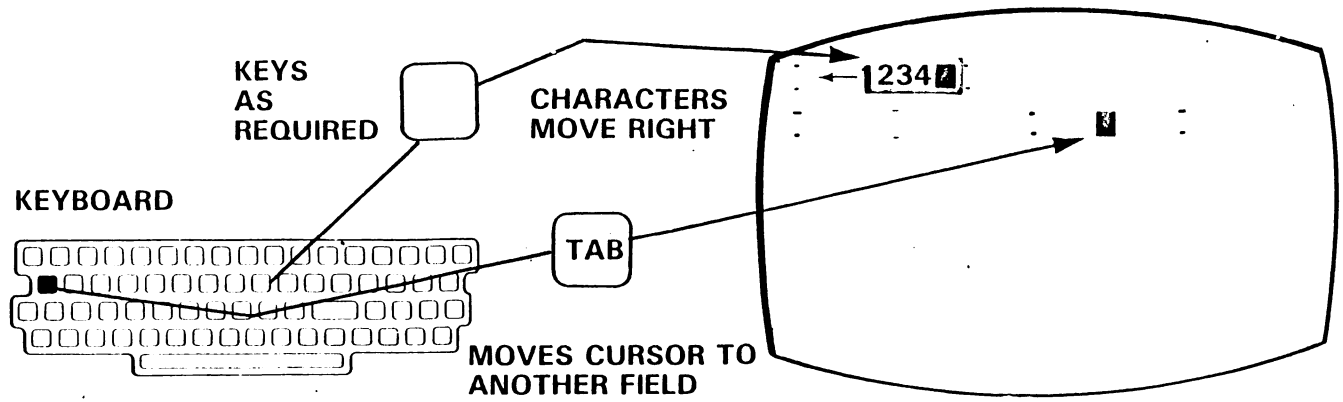
When using the selective tabulation facility, characters may be entered in the tabulation mode against a right-hand margin. To set decrement tabulation:

1. Set up selective tabulation as in steps 1 and 2 above and press carriage return.
2. Tab to the required field.
3. Press the DEC key.
4. Repeat as required in conjunction with steps 3 and 4 of selective tabulation.



When entering information, tab to the decrement tabulation field.

Type the characters in normal order. The characters are entered from right to left until the TAB key is pressed to move to another field.



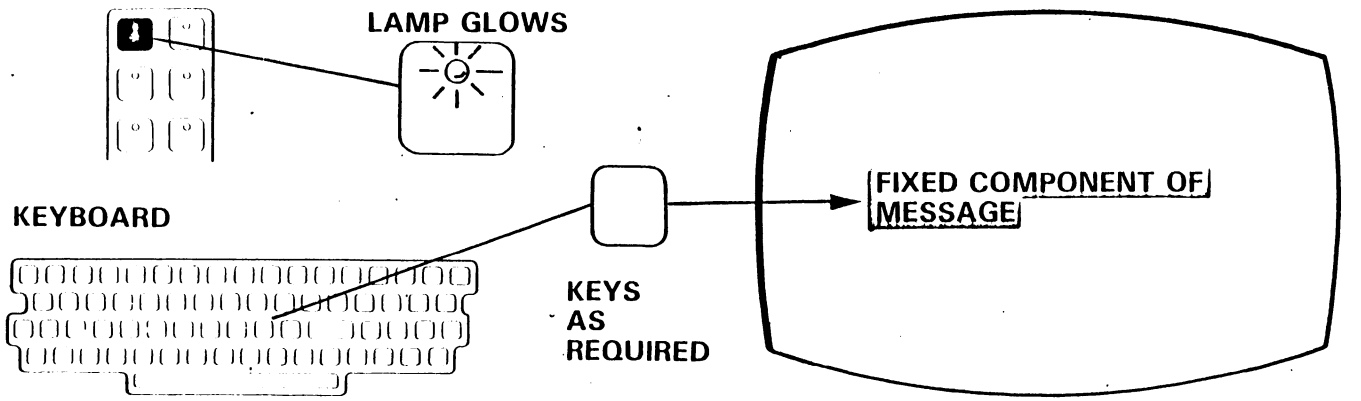
The F* key enables a prepared message to be protected to prevent alteration by typing over the text. The F* key will not be effective until text has been entered on the screen. Note that only automatic tabulation may be used with protected format.

The F* key is used when a frequently used text or table is made up of a fixed part and a variable part. The protected text may be stored and recalled as required and the variable part of the text entered.

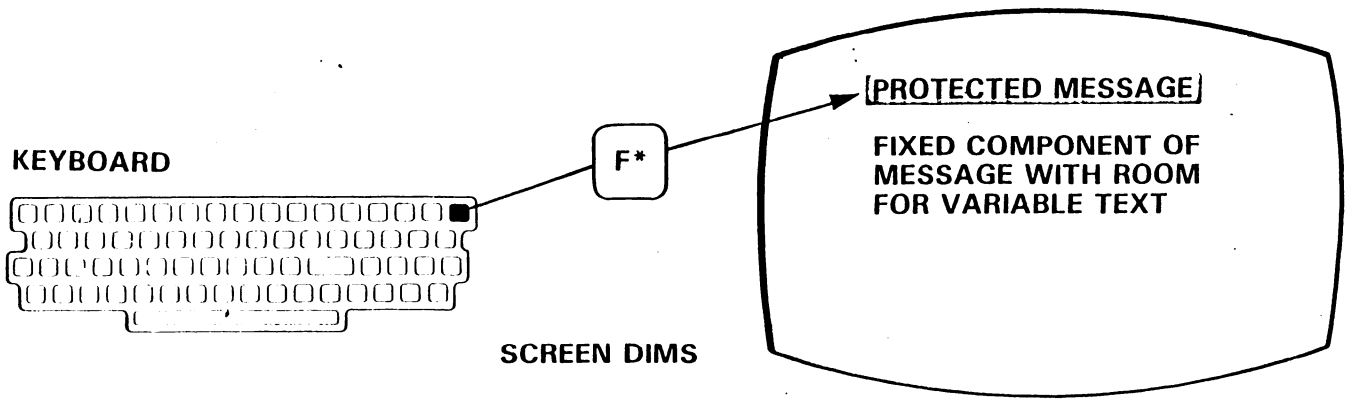
To set up a protected format:

1. Press the PREPARATION key and then enter the fixed information on the visual display screen.

NOTE: When leaving room for variable text, use the cursor, not the space bar.

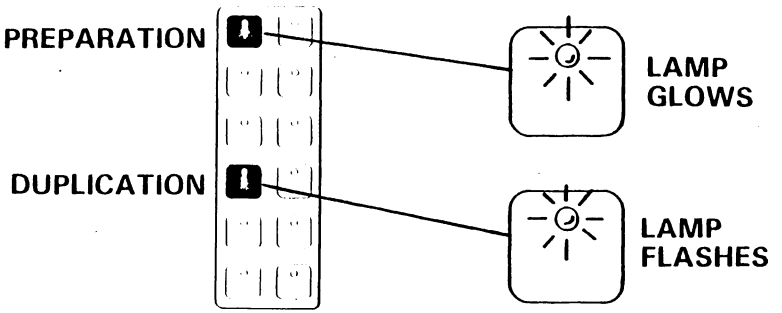


2. Press the F* key. The message will now have an F status in the log.

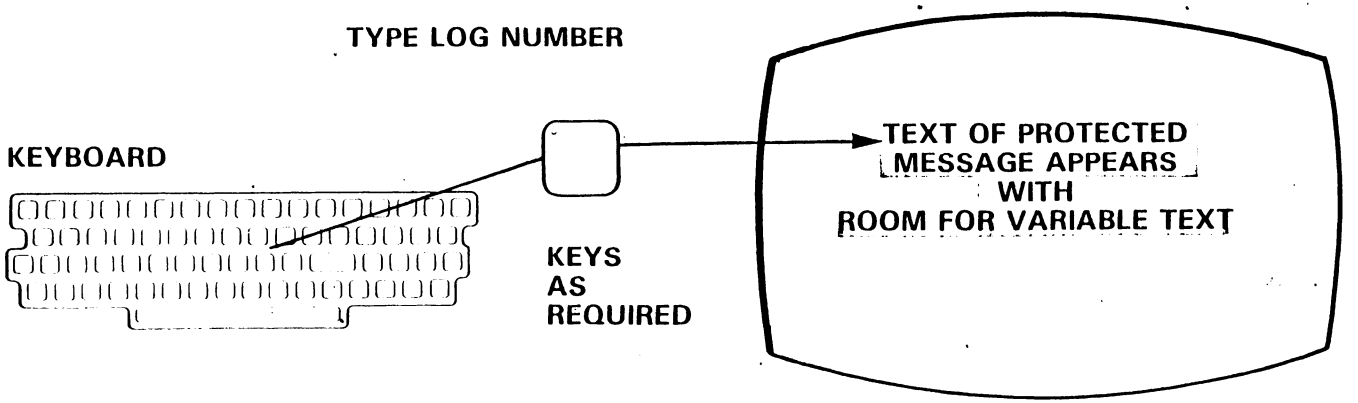


To use a protected format stored in the memory:

- Press PREPARATION switch and then DUPLICATION key.

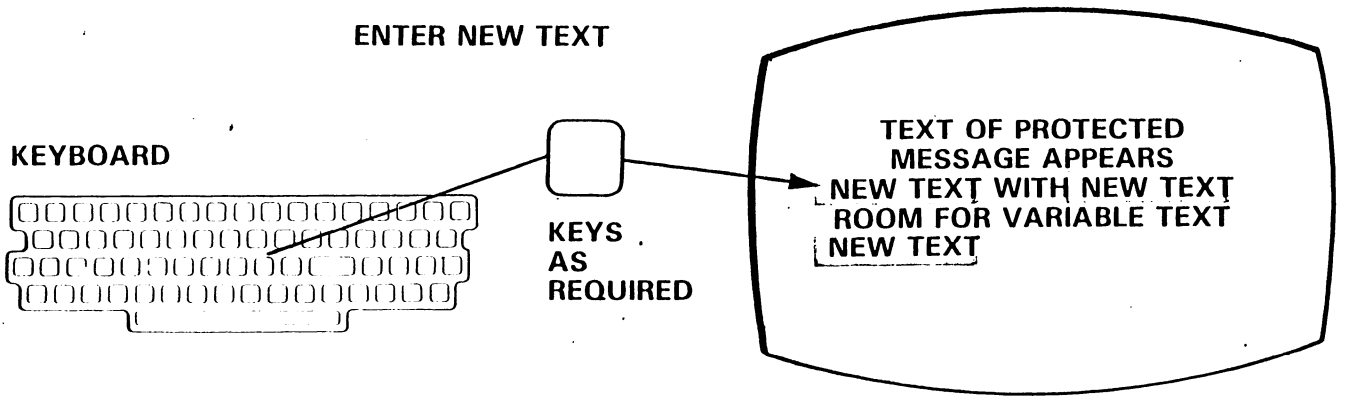


- Type log number of the protected message.



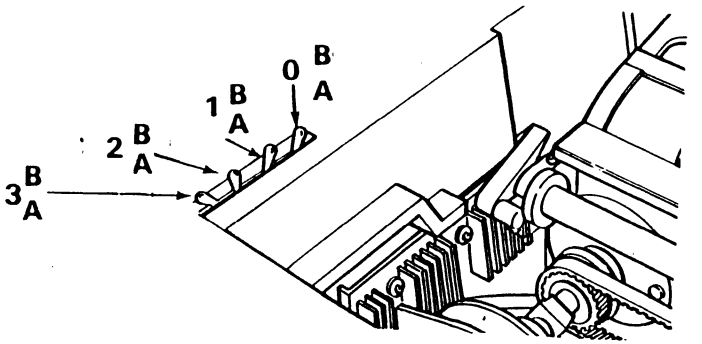
- Enter new text in protected message.

NOTE: The new text may be edited at this stage but not the protected portion. You may erase the protected portion by using the ERASE function described in Section 6.



FUNCTION SWITCHES

A small switch panel is located under the machine cover on the left-hand side. There are 4 switches, labelled 0 to 3.

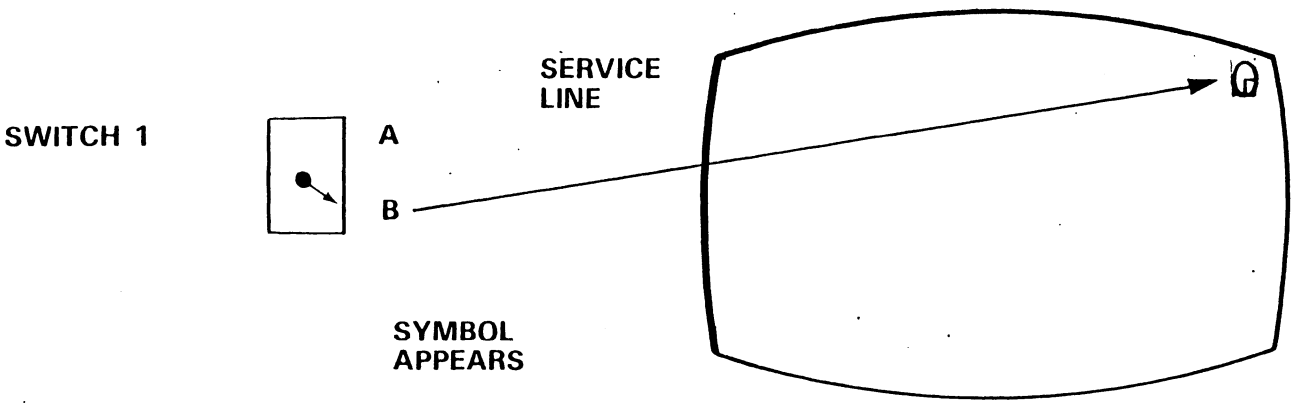


SWITCH	FUNCTION	POSITION A	POSITION B
0	Automatic erasure of transmitted messages	No	Yes See Note 1
1	Incoming messages stored in memory	No	Yes See Note 2
2	Printer line feed	Single space	Double space
3	Line feed after clearing	Two lines	Six lines

These switches may be set as required.

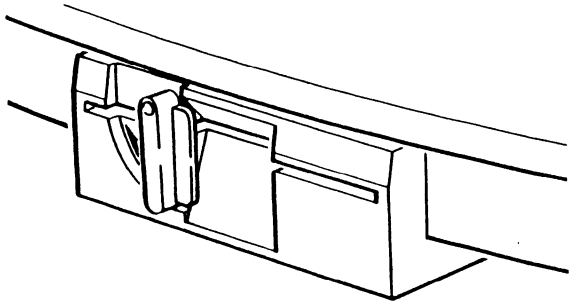
NOTE 1: Selection of the B position on switch 0 will erase a message after it has been transmitted. The indicator ERA will appear at the end of the printed line log at the end of the message.

NOTE 2: Selection of the B position on switch 1 causes the symbol Ø to be displayed in the service line of the visual display screen.



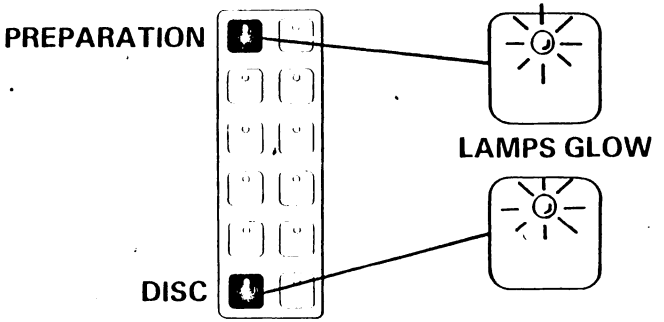
The disc storage option provides an additional storage capacity of up to 115,000 characters. The disc drive is located under the teleprinter keyboard on the left-hand side and this accommodates a floppy disc. With the disc facility engaged, all messages prepared on the visual display screen are recorded on the disc as well as in the electronic memory.

NOTE: To obtain optimum advantage from the disc option, the 'O' Function switch should be in the 'B' position so that messages are automatically erased from electronic memory when they are transmitted.



To use the disc storage facility:

1. Press the DISC switch.
2. Press the PREPARATION switch.
3. Prepare the message. If automatic transmission is required, type in the wanted customer's number in the Address Line.



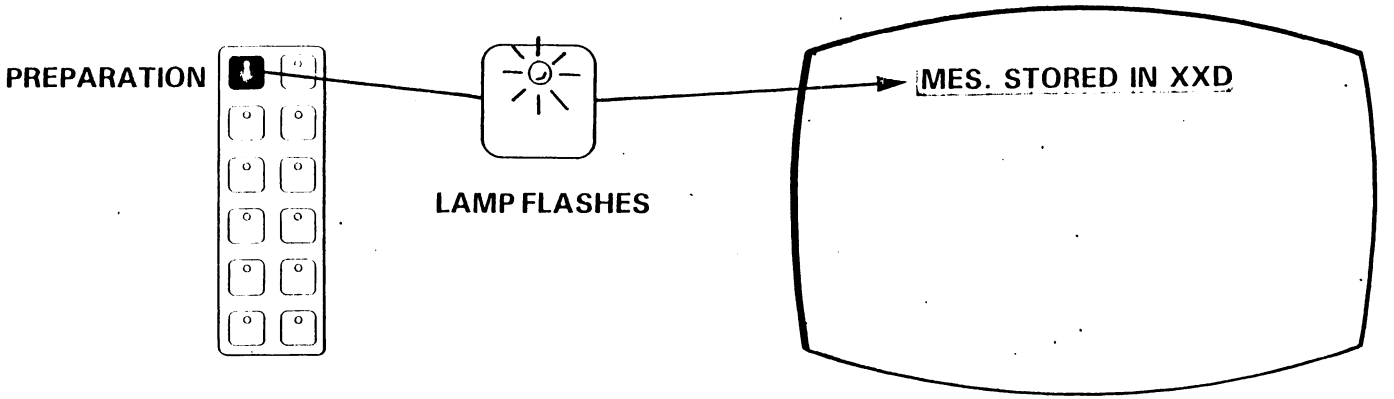
4. Press the PREPARATION switch. The lamp flashes while the message is recorded on the disc and in the electronic memory.

   The Service line displays:

   'MES. STORED IN XXD'

   (XX is the log number and 'D' indicates disc).

NOTE: Usually, the disc log number will differ from the electronic memory log number for the same message.



DISPLAYING, PRINTING or ERASING A MESSAGE RECORDED ON DISC

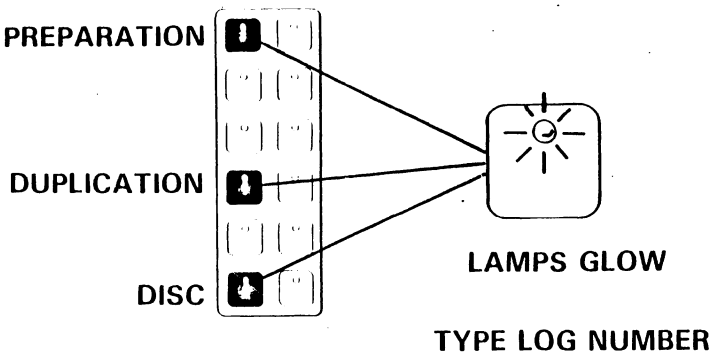
These functions are performed on the disc memory in a similar manner to the same functions performed on electronic memory. The DISC switch must be ON. The disc log number, ie 'XXD' must be used.

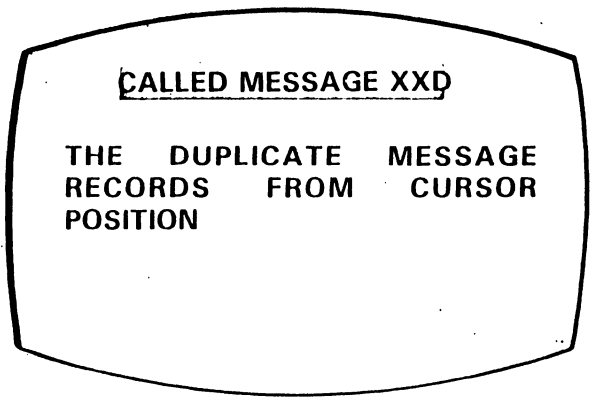
DISPLAYING
PRINTING
ERASING **(See Section 6)**

DUPLICATING A DISC MESSAGE ONTO ELECTRONIC MEMORY

1. Press the PREPARATION switch. Type any new information required in message beginning.
2. Press the DISC switch (if not already ON).
3. Press the DUPLICATION switch, then type the log number of the disc message to be duplicated.

The service line displays 'CALLED MESSAGE XXD'. The DUPLICATION lamp goes out.

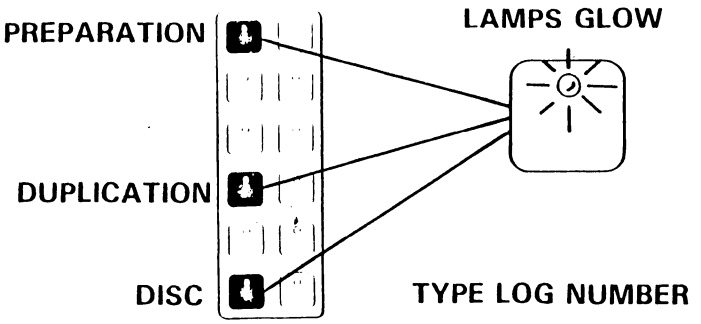


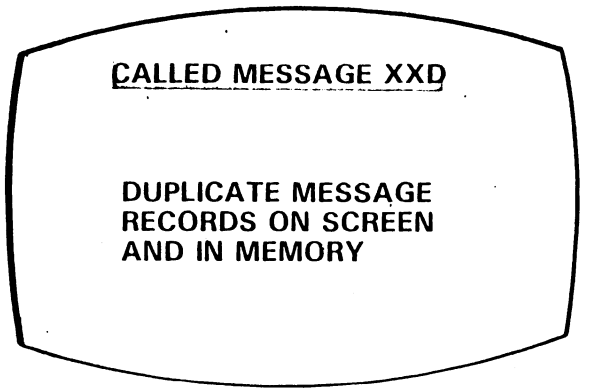


COPYING A MESSAGE FROM ONE DISC TO ANOTHER DISC

NOTE: Both discs must be formatted.

1. Press the DISC switch. Lamp glows.
2. Press the PREPARATION switch.
3. Press the DUPLICATION switch.
4. Type in the log number of the message to be copied.

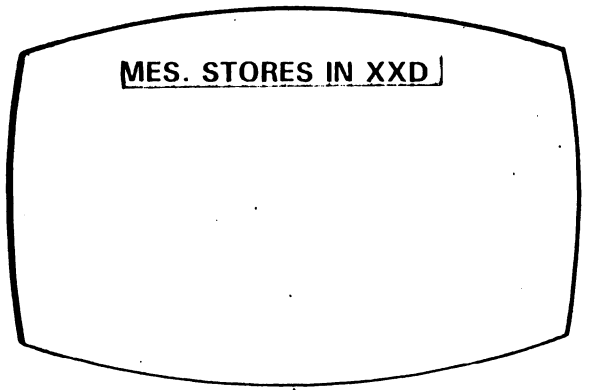




5. While still in the PREPARATION mode, lift the disc drive lever, remove the existing floppy disc. Insert the new disc and pull the lever down.
6. Press the PREPARATION switch. The lamp goes out and the message is recorded on the new disc.

EXCHANGE DISCS

PREPARATION LAMP GOES OUT

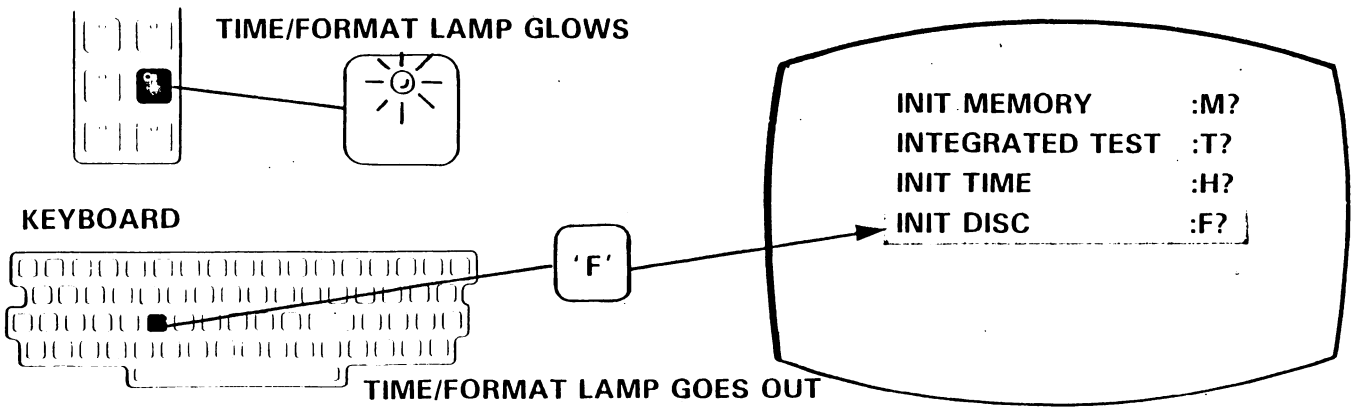


FORMATTING THE DISC

When a new disc is inserted in the teleprinter or when it is desired to completely erase all the messages that are recorded on a disc, it is necessary to use the disc formatting procedure. The TIME/FORMAT switch in the OPERATION SWITCHES group is used for this purpose.

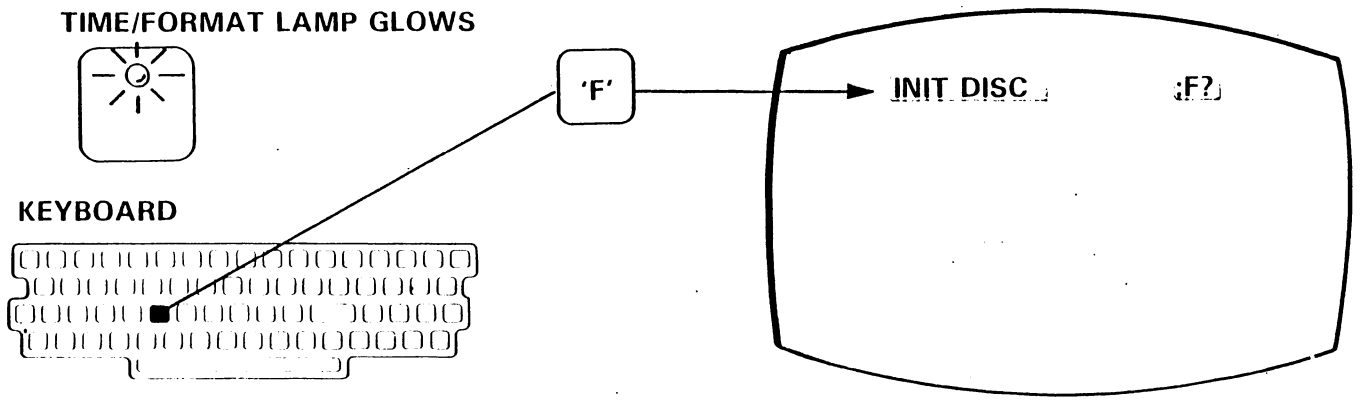
FORMATTING A NEW DISC

1. Press the TIME/FORMAT switch. A menu appears on the screen.
2. Type letter 'F'. The menu disappears and the disc unit performs checking for approximately 1 minute.
3. The menu reappears. Wait until the screen is clear. The floppy disc is now formatted ready for use.

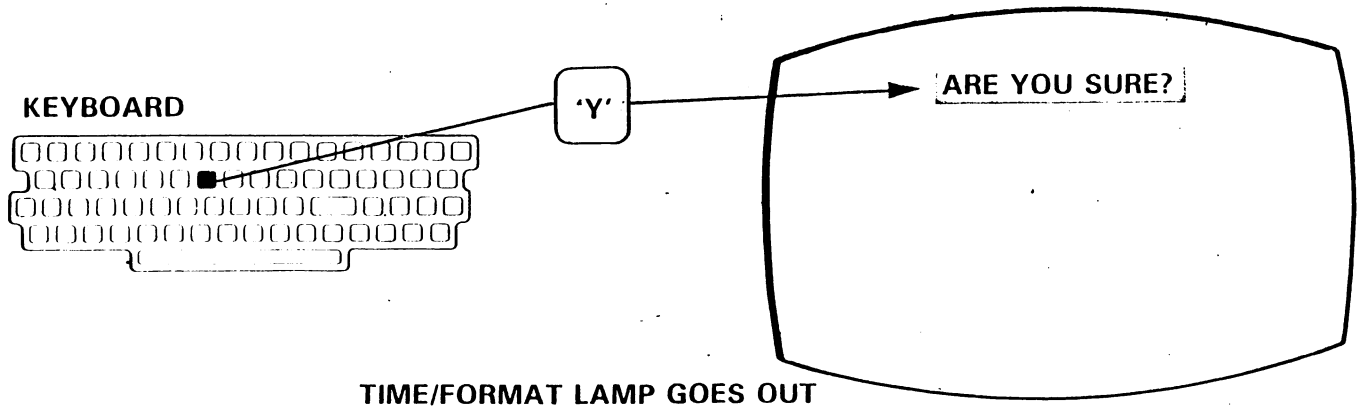


FORMATTING (or ERASING) A USED DISC

1. Press the TIME/FORMAT switch. A menu appears on the screen.
2. Type letter 'F'. The screen clears and the disc unit performs checking for approximately 1 minute.



3. If there is any information on the floppy disc, the SERVICE LINE displays 'ARE YOU SURE?'. To proceed with formatting, type letter 'Y'.
4. The disc unit performs erasing and reformatting for approximately 30 seconds and the menu reappears. Wait until the screen clears. The floppy disc now has a clear memory ready to accept messages.



PRECAUTIONS IN HANDLING DISCS

When handling a floppy disc:

- Keep the disc in its protective cover for as long as possible.
- Do not touch the surface of the disc.
- Do not use any object or material to clean the disc.
- Do not bend the disc.

CAUTION

For reliable disc performance it is essential that only high quality floppy discs are used.

STORING FULL DISCS

Each floppy disc has a label for identification purposes. It is advisable to use a printed copy of the disc log as a record of the messages residing on the disc. This copy can be kept in an envelope with the disc.

Additional Precautions:

- Do not deform the disc. Use a felt marker pen to write on the disc label, not pencils or ballpoint pens.
- Do not use an eraser on the label, or stick labels one over the other.
- Do not cover the window in the protective cover, even partially.
- Do not expose the disc to sunlight, excessive heat, magnetic fields or cover it with heavy objects.
- Store discs vertically when not in use.

Floppy Disc Specification:

5.25 inch, one sided, double density, single index hole (soft sectored).

International telex calls are connected through the Overseas Telecommunication Commission's international exchange in Sydney, known as INTLX.

Calls to most countries are switched through the exchange automatically, and some are connected by the operator. Every country, whether connected automatically or via the operator, uses a destination code.

A list of destination codes can be found in the information pages of your Telex Directory; operator-connected countries are marked by an asterisk.

PREPARING YOUR MESSAGE

For calls switched automatically via INTLX:

- prepare your message on the visual display screen for automatic transmission,
- after pressing end of message insert 020 (the INTLX access code) followed by an oblique stroke, the wanted Telex number and plus sign.

Assistance to Automatic Destinations:

If required, the assistance of an operator is available on calls to automatic destinations by typing '00' (figures) before the destination code. These calls proceed as for a manual destination and are charged on a three-minute minimum basis. (Do not space when typing the assistance code, destination code, the wanted number and the plus sign, eg 005153944+).

OVERSEAS TELEX ENQUIRIES

The Telex Directory details fully the procedures for making enquiries related to overseas telex calls or reporting problems.

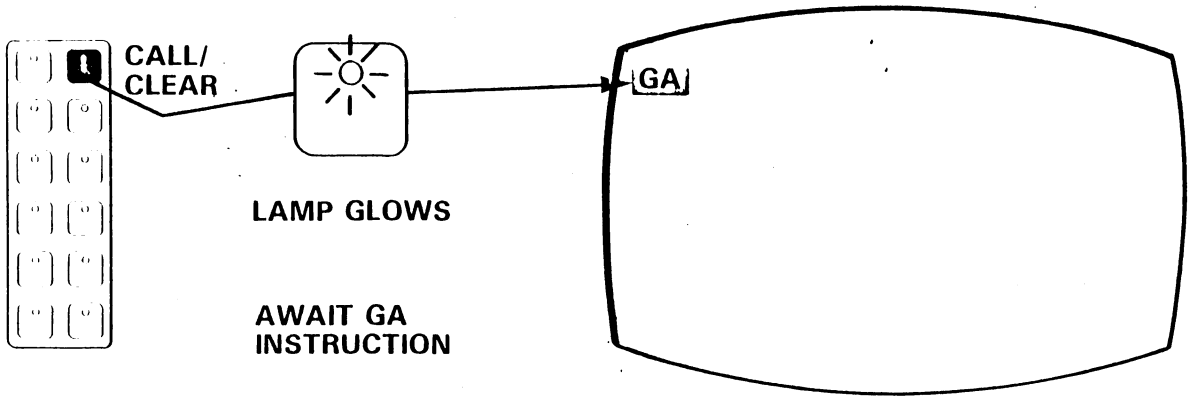
Use the following numbers:

- Directory information —
  020 0141+
- General enquiries —
  020 0143+
- Reporting cutoffs or wrong numbers —
  020 0145+

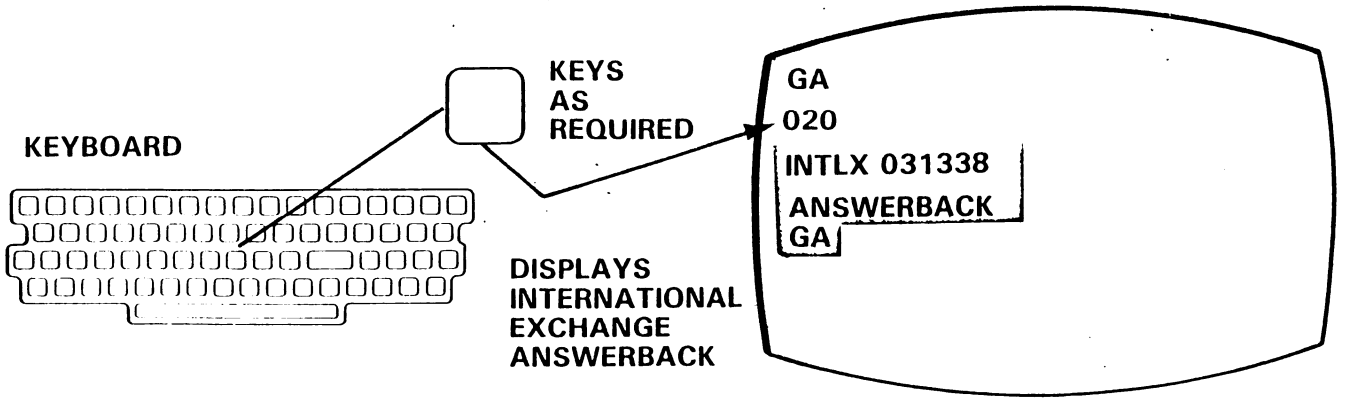
To make an international call switched through INTLX by the operator:

1. Prepare and store the message as for manual calling.

2. Press the CALL/CLEAR switch.

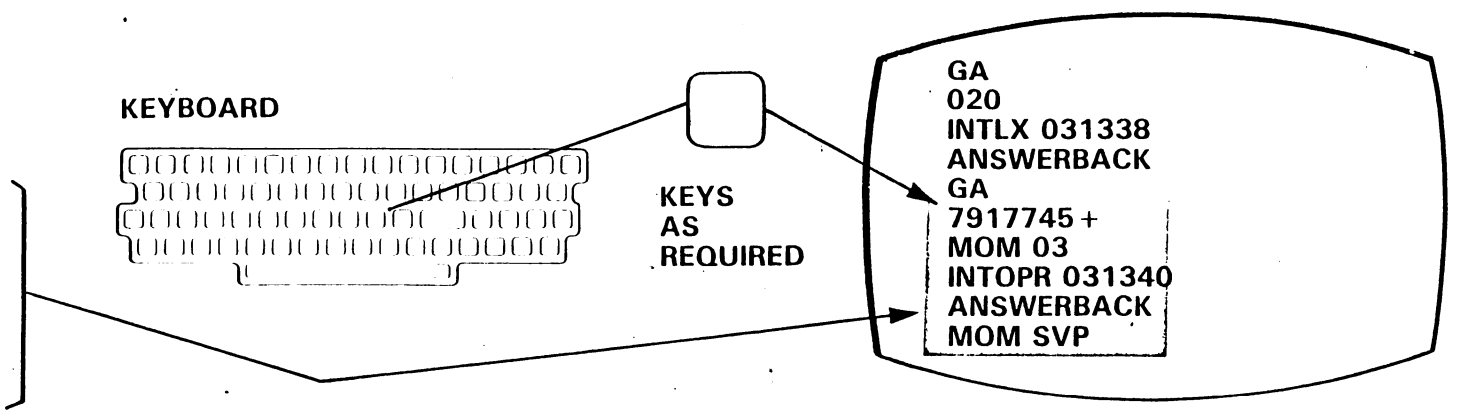


3. Type 020. The international exchange answerback, including the date/time is displayed. Your answerback and GA appears.

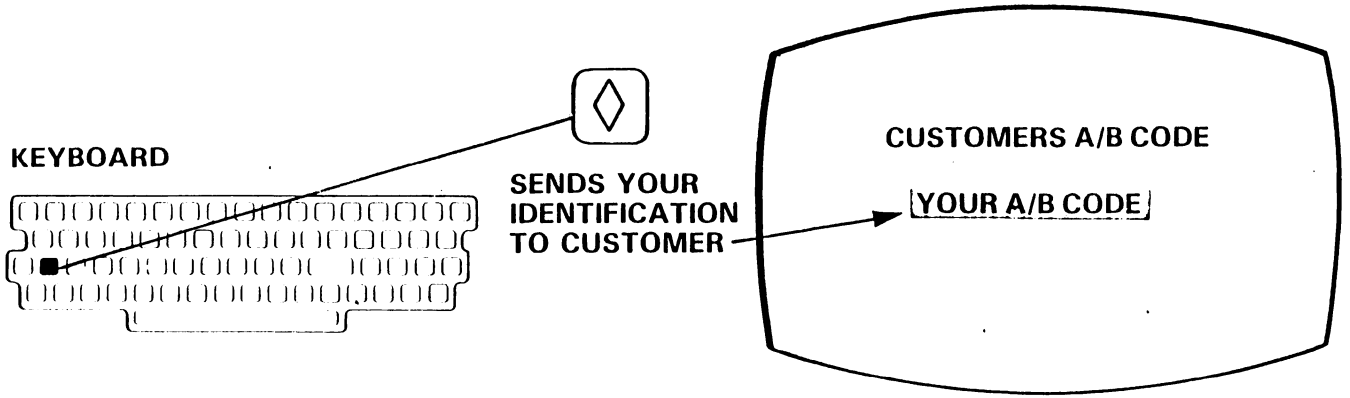


4 Type destination code, wanted customer's number and a + sign. The following information is received:

- Details of position in the queue.
- Answerback from the INTLX operator and a reference number.
- Your answerback code will appear again.
- An acknowledgement code (MOM SVP).

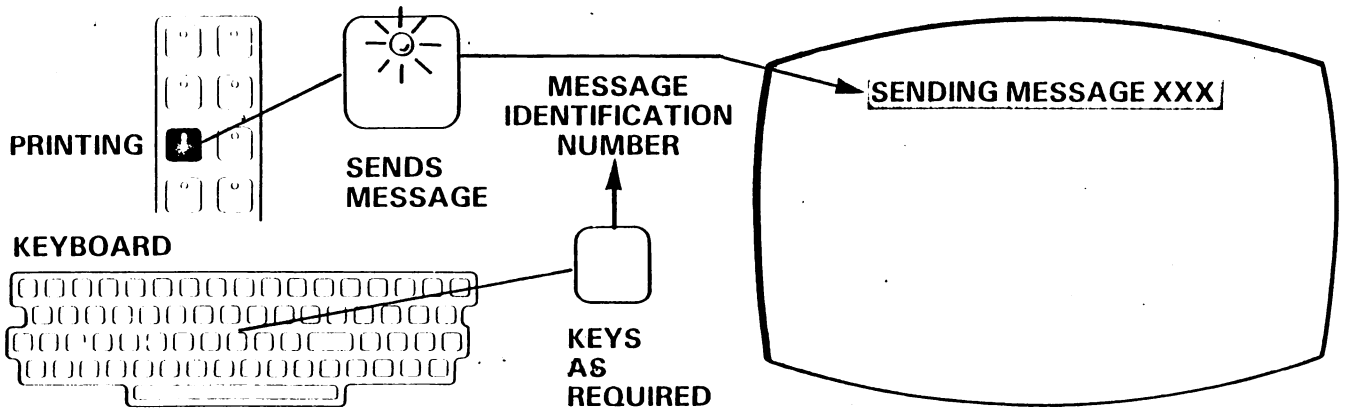


5 Wait whilst the call is connected. When the answerback of the wanted customer is received, press the here is key.



6 Press the PRINTING switch and type the message identification number. This action causes the message to be transmitted.

To prepare another message proceed as detailed on page 49.



THE SERVICE CENTRE

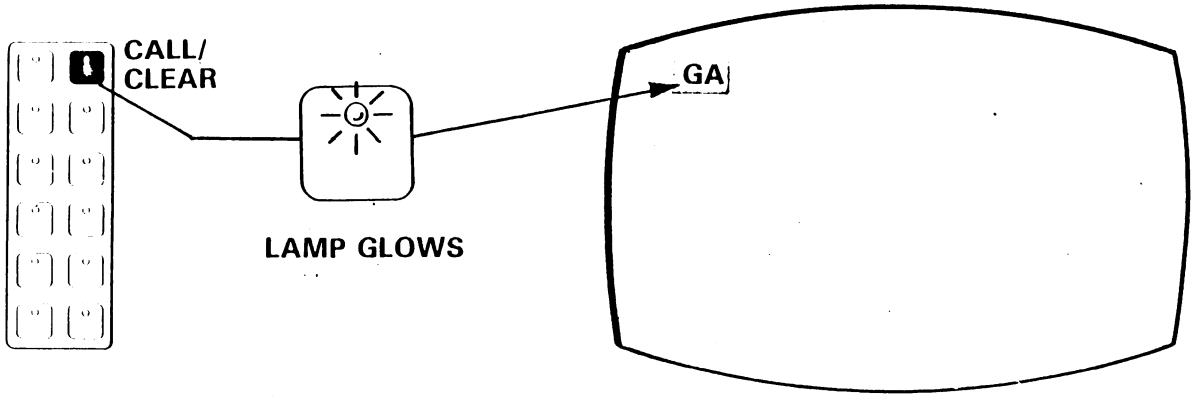
You may call the Service Centre:

- To report service difficulties and faults.
- For directory assistance.
- To make special types of call.
- For general enquiries.

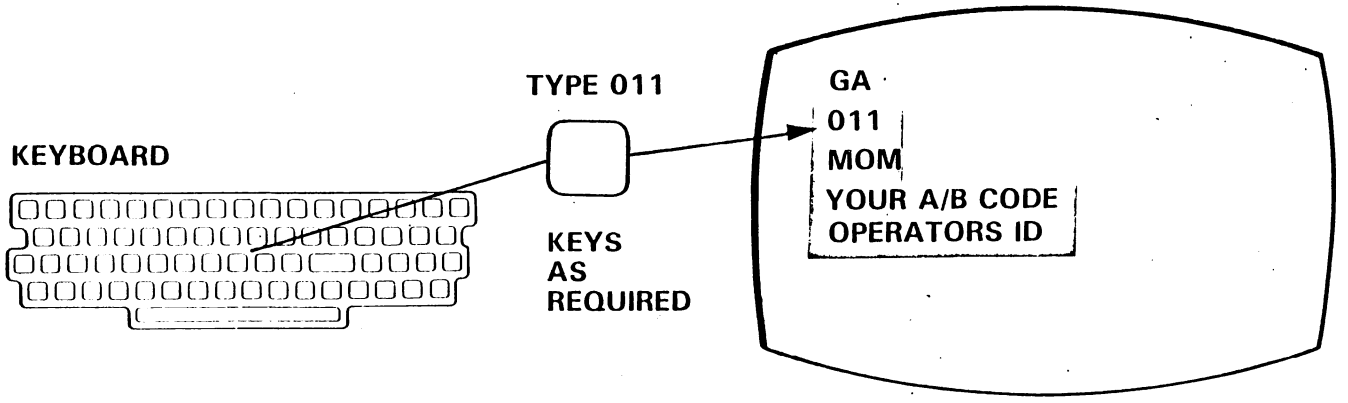
THERE IS NO CHARGE FOR CALLS TO THE SERVICE CENTRE

To make a call to the Service Centre:

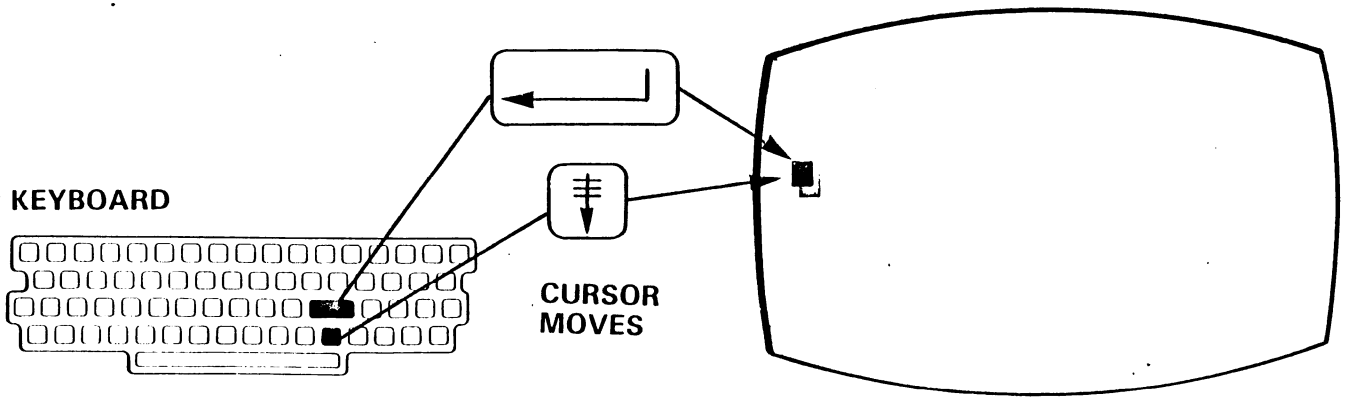
1. Press the CALL/CLEAR switch and await GA.



2. Type 011. MOM is received; wait until the answerback code and the operator's identification is received.

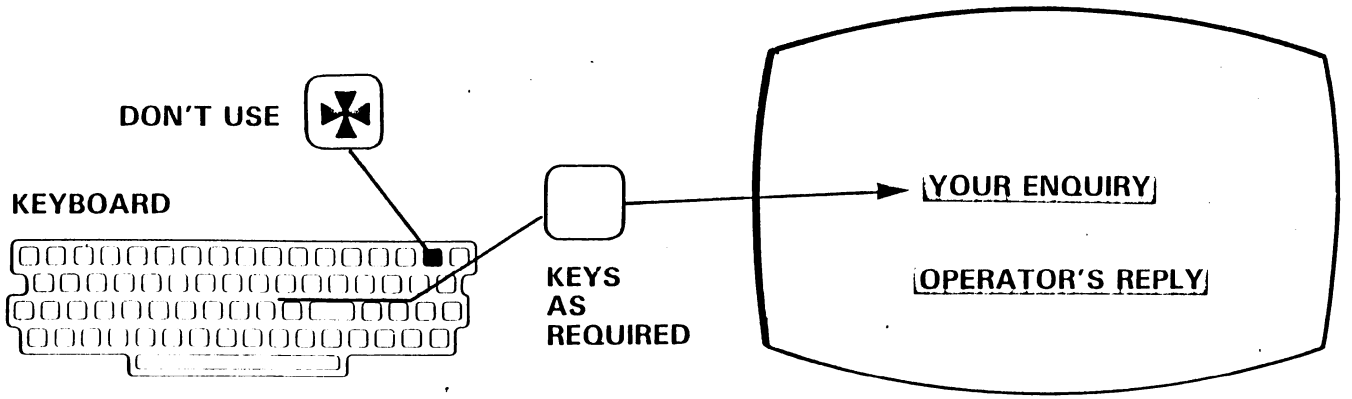


3 Press the new line key and the line feed key.

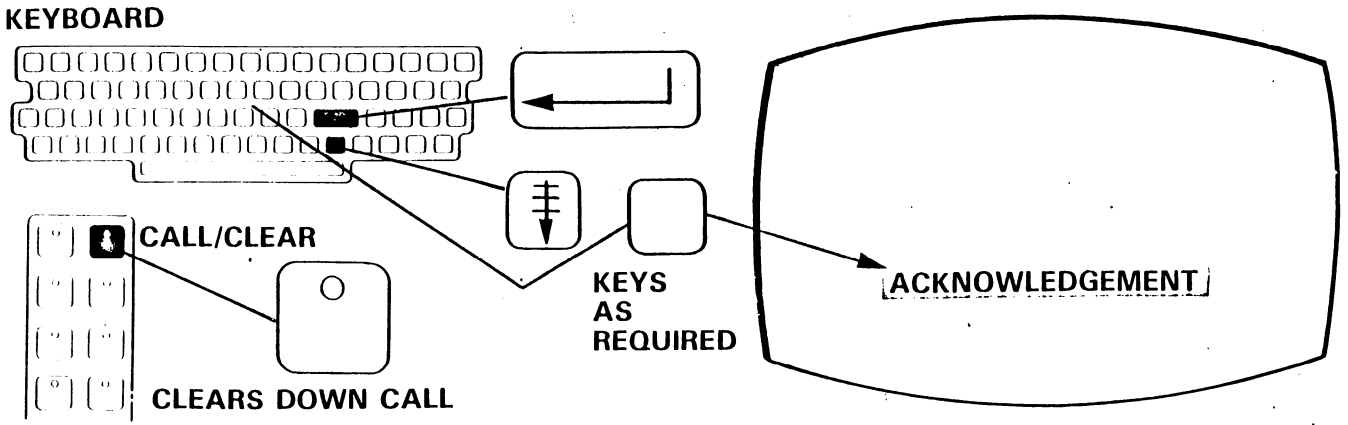


4 Type the enquiry, and wait for the operator's reply.

NOTE: Do not use the who are you key.



5 Acknowledge operator's reply, then press the new line key, the line feed key and CALL/CLEAR switch to complete the call.



CONFERENCE AND BROADCAST CALLS

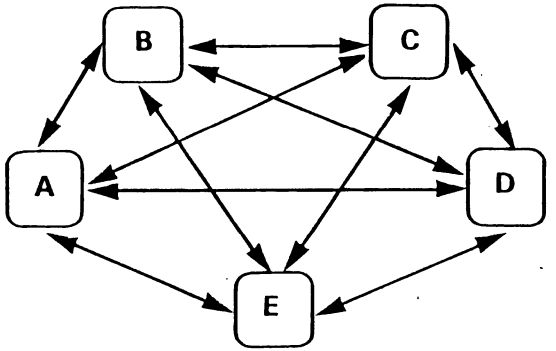
Conference and broadcast calls enable you to send a message simultaneously to a number of telex services. On conference calls, you may send to all parties and each connected party can type, in turn, to each other party. The message will be seen by all parties.

On broadcast calls, you may transmit and the message is received by all parties but the other parties cannot type back to you or to each other.

There are two methods of making conference or broadcast calls —

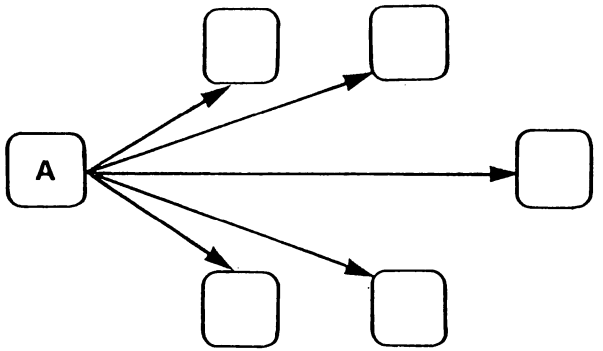
- Operator-connected through the service centre (011), or
- Via the automatic conference/broadcast facility.

All conference or broadcast calls must be made by using manual calling.



CONFERENCE CALL

MULTI-WAY BETWEEN ALL SERVICES



BROADCAST CALL

FROM ONE TELEX SERVICE ONE-WAY

CONFERENCE/BROADCAST CALLS THROUGH THE SERVICE CENTRE

Conference or broadcast calls made through 011 allow you to send a message to a minimum of two and a maximum of ten telex services simultaneously. The calls attract a three-minute minimum charge in addition to special charges which apply. The service centre operator (011) will give you full details.

To make a call through the service centre, use the procedure outlined on pages 88/89.

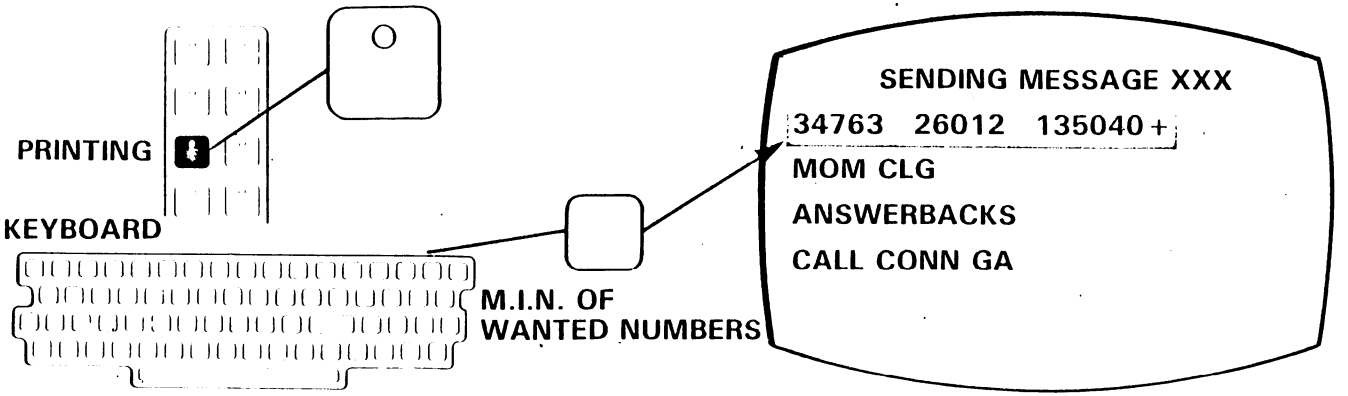
FOR MANUAL CONFERENCE OR BROADCAST CALLS — CALL 011

NOTE: It is important that you:

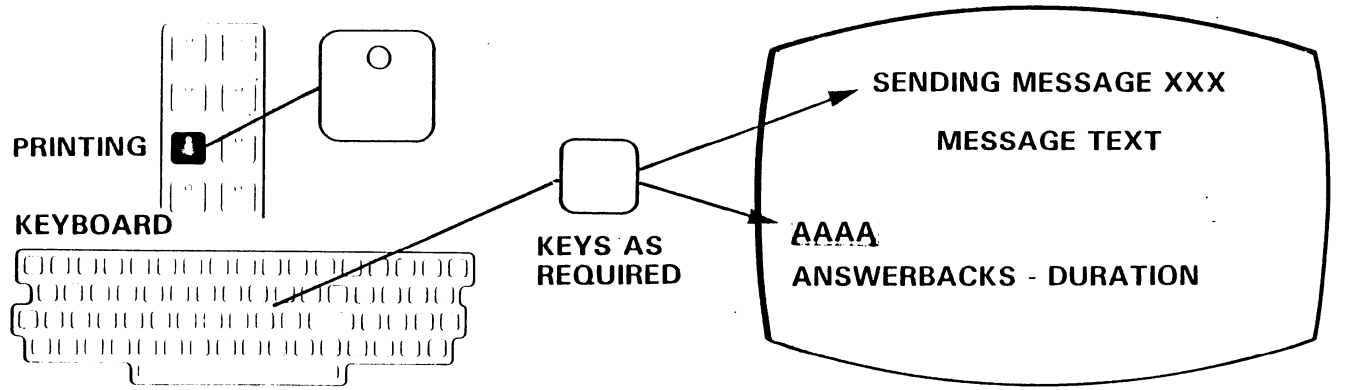
- Indicate the type of call required (CFCE or BCAST), and type each wanted customer number on a separate line.
- Do not begin transmission until the service centre operator types 'CFCE (OR BCAST) CONN GA'.
- Press the 'HERE IS' key to ensure identification.
- DO NOT use the 'WHO ARE YOU' key.

ASK FOR 'CFCE' OR 'BCAST'

4. Press the PRINTING switch and type the M.I.N. of the wanted numbers.
5. The wanted numbers are printed and you receive 'MOM CLG'.
6. The wanted answerbacks appear followed by a date and time group and 'CALL CONN GA'. Check the answerbacks — if any are incorrect, clear down and start again.



7. Press the PRINTING switch and type the M.I.N. of the message to be sent.
8. At the end of the message, the alarm sounds. To clear the call, type AAAA. The answerback of each party appears followed by the connection duration for each particular service. The connection is then cleared down automatically.

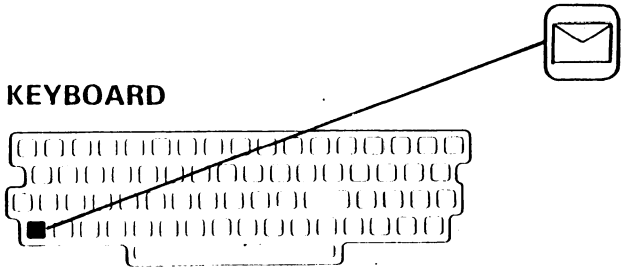


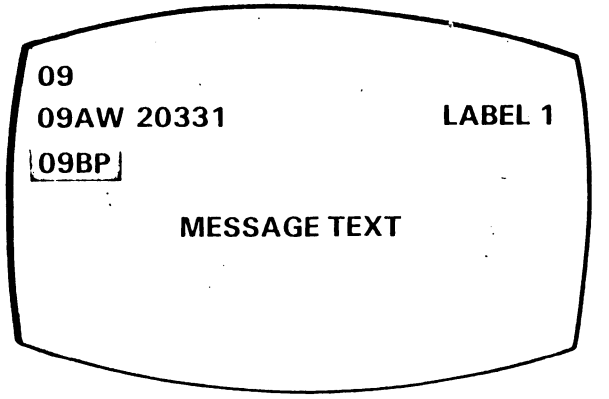
NOTE: For more details on automatic conference/broadcast calls see the handbook 'HOW TO USE THE FACILITIES ASSOCIATED WITH COMPUTERISED TELEX EXCHANGES'.

With the re-try option, a message may be sent automatically to more than one customer up to a maximum of 20. Re-try and delayed delivery also functions with multi-addressing. First, prepare the message and enter the details in the address line for the first customer as described on pages 34 to 36, then:

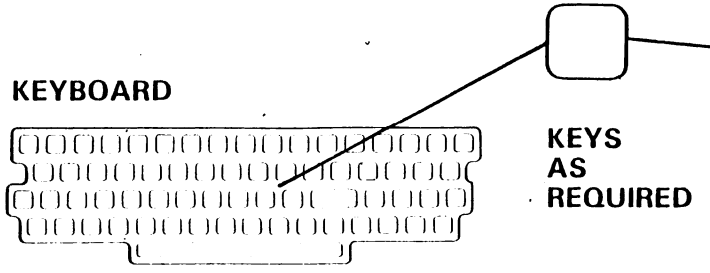
SENDS A MESSAGE AUTOMATICALLY TO SEVERAL CUSTOMERS

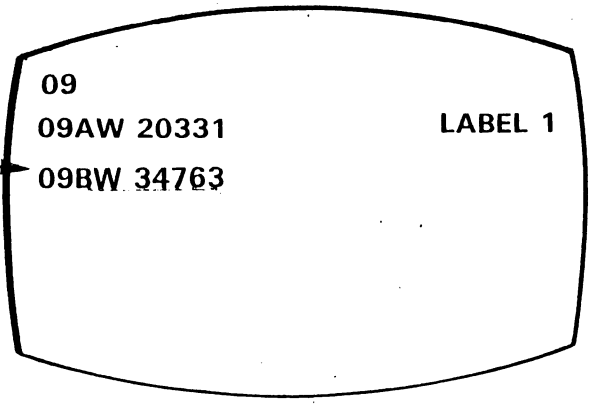
1. Press the end of message key. The fourth line of the visual display screen shows an extra address line, with the message identification number suffixed by the letter B. The message text moves down one line.



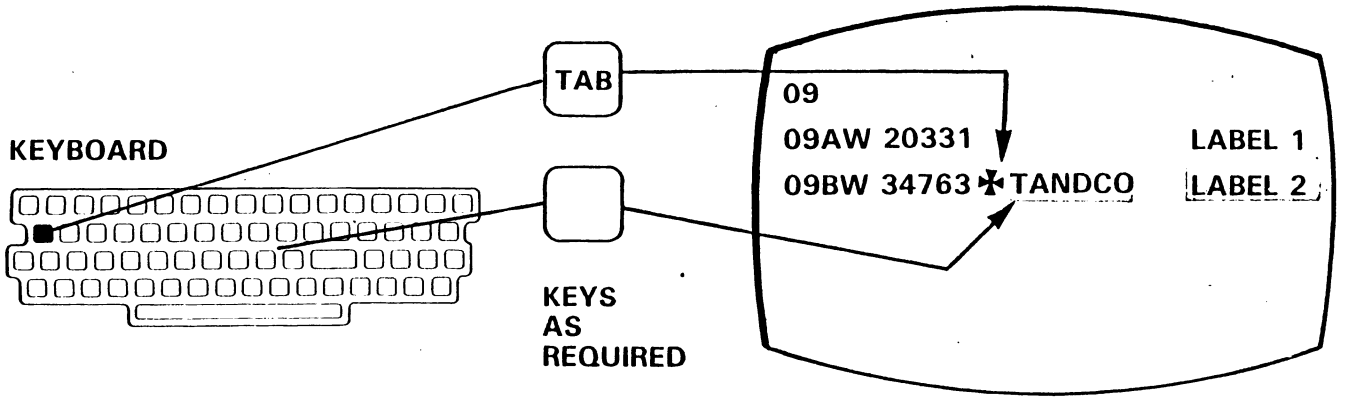


2. Type the Telex number of the next customer.

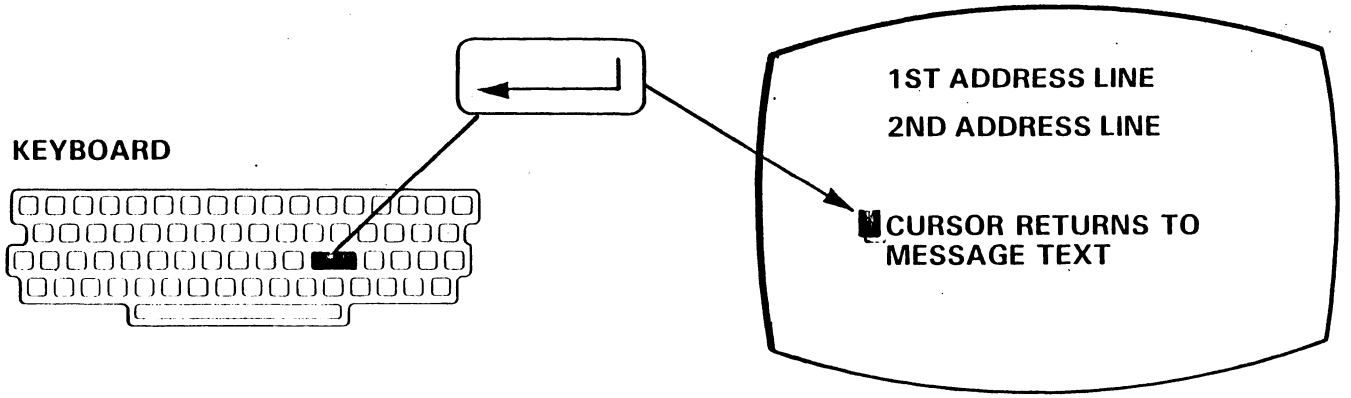




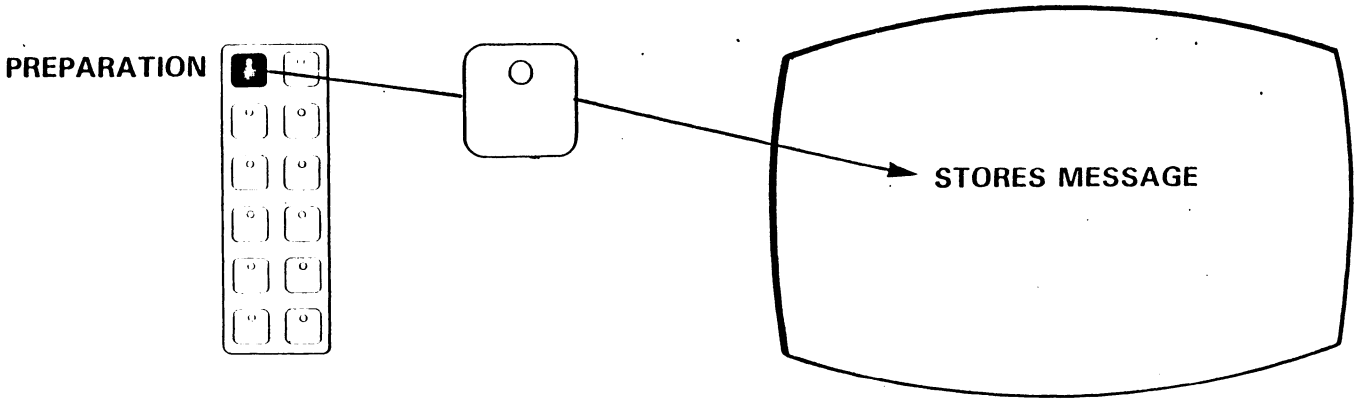
3. Press the TAB key as required. Insert answerback verification and/or message label as required.



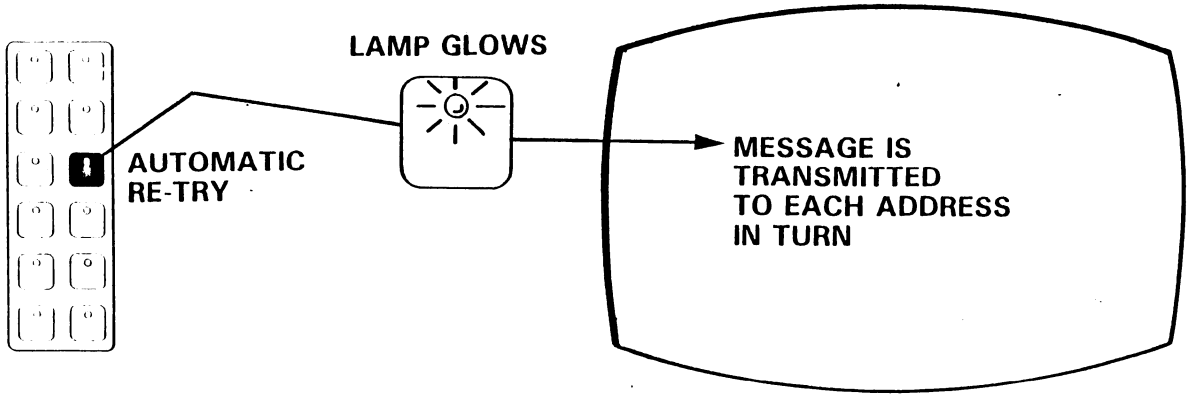
4. To add more addresses, repeat this procedure. You may enter the text of the message again by pressing the new line key or using the cursor controls.



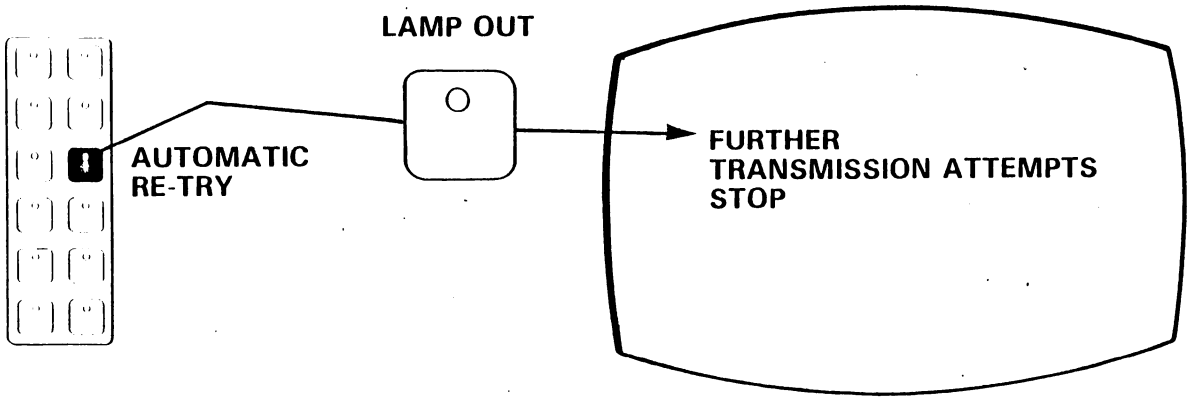
5. Store the multi-addressed message in the memory for subsequent transmission by pressing the PREPARATION switch.



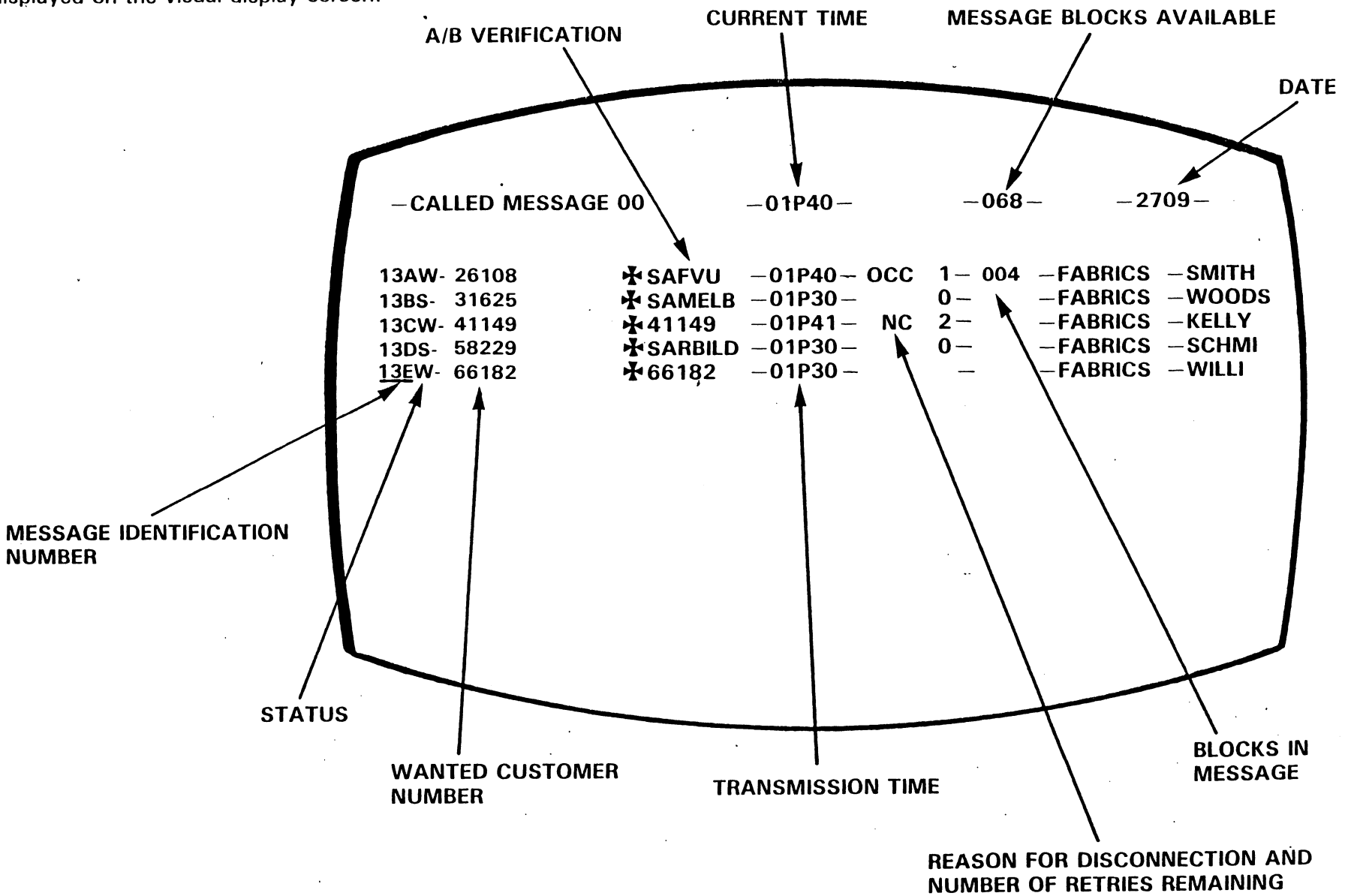
6 To transmit the multi- addressed message, press the AUTOMATIC RE-TRY switch if it is not already on.

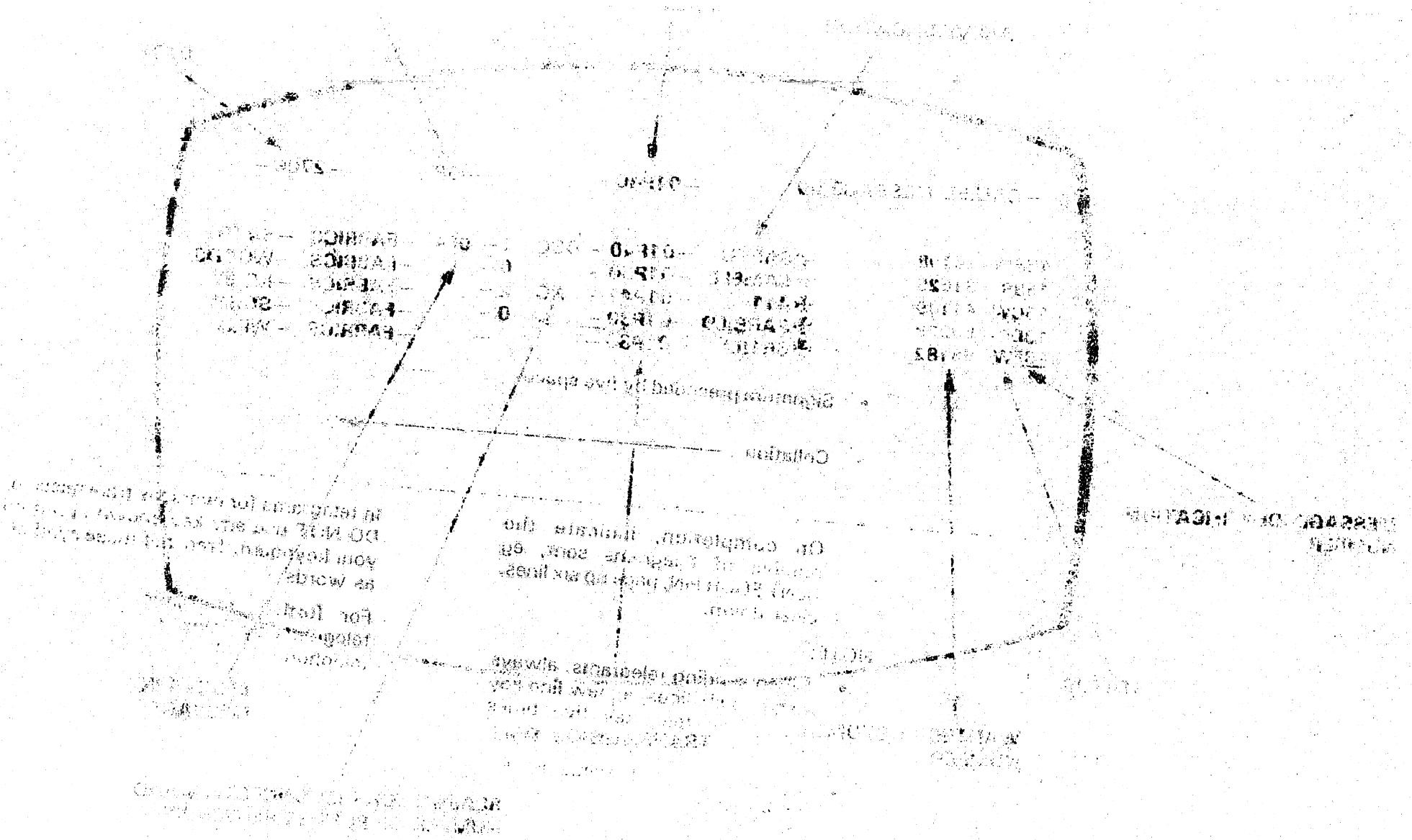


7 You may stop further transmission attempts by pressing the AUTOMATIC RE-TRY switch again.



Here is an example of a multi-address log displayed on the visual display screen.





Telegrams may be sent from the teleprinter for delivery within Australia or overseas. The telegram may be transmitted directly from the keyboard, or prepared for manual calling, stored in the memory and then transmitted. Each telegram should be prefixed with your answerback for identification purposes.

Automatic calling should not be used to transmit telegrams.

For telegrams within Australia; call 015.

Prepare the telegram using the following format:

- Delivery details, e.g. → **TF267178**
  JOHN TAYLOR
  PERTH WA
- Message → **SEND FOUR BOOKS L42 URGENT**
- Signature preceded by five spaces → **SERVAD**
- Collation → **COL TF267178 L42**

To send several telegrams:

- After the collation of each message, page up six lines, ie new line key once and line feed key five times, press here is, then commence transmission of the next telegram.
- Obtain the answerback of the receiving telegraphist after the collation of the last message.

On completion, indicate the number of telegrams sent, eg SENT FOUR FIN, page up six lines, clear down.

NOTE:

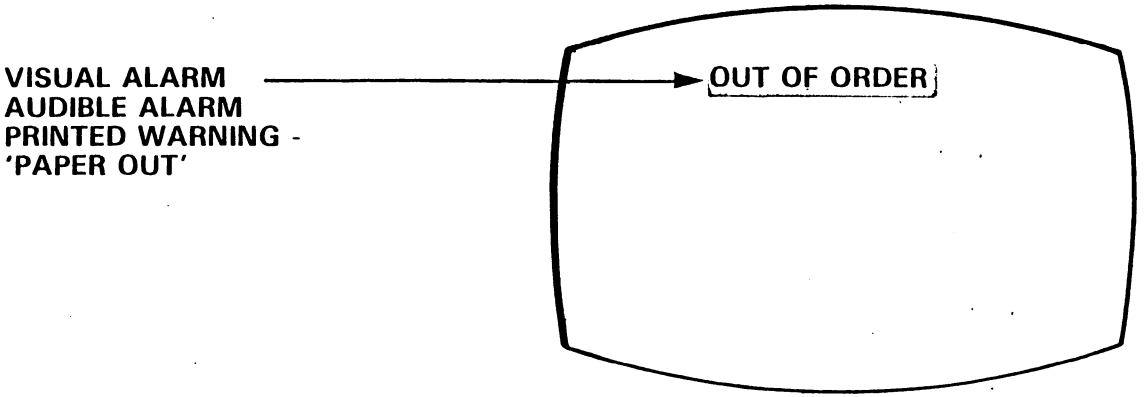
- When sending telegrams, always page up six lines, ie new line key once, line feed key five times before clearing down.
- Tabulation on telegrams is not accepted.

In telegrams for overseas transmission, DO NOT use any key shown in red on your keyboard. Transmit these symbols as words.

For further information on sending telegrams by Telex, call Telex 015 or telephone 0174.

PAPER ALARMS

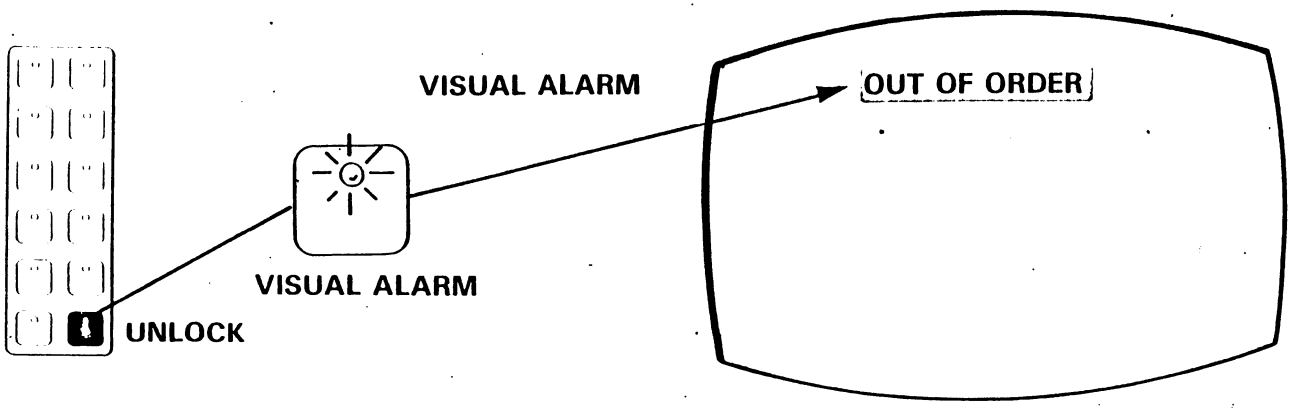
If the printer is used to print the text of a prepared message and the paper is almost depleted, an audible alarm sounds, the words PAPER OUT are printed and OUT OF ORDER appears on the service line of the visual display screen.



If the teleprinter is transmitting or receiving a message and the paper roll is almost depleted, the audible alarm sounds. If the full text of the message being sent or received is in danger of not being printed due to lack of paper, the machine automatically clears the call.

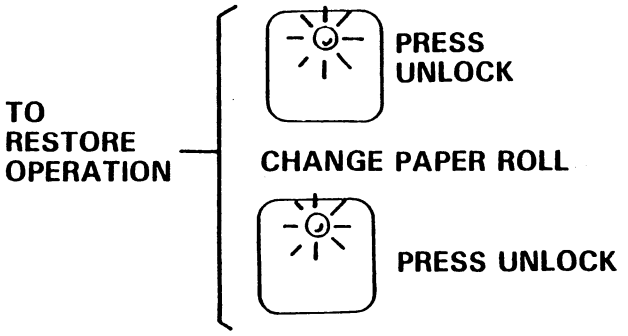
AUDIBLE
ALARM

In addition, OUT OF ORDER is displayed on the service line of the visual display screen, the UNLOCK lamp glows and 'PPPP DER' is printed on the paper roll.



PAPER ALARMS

When the paper alarm operates, press the UNLOCK switch to silence the alarm, change the paper roll and then press the UNLOCK switch to restore normal operation.



LIFE BOAT
MAST SUPPORTS
MEN BOAT

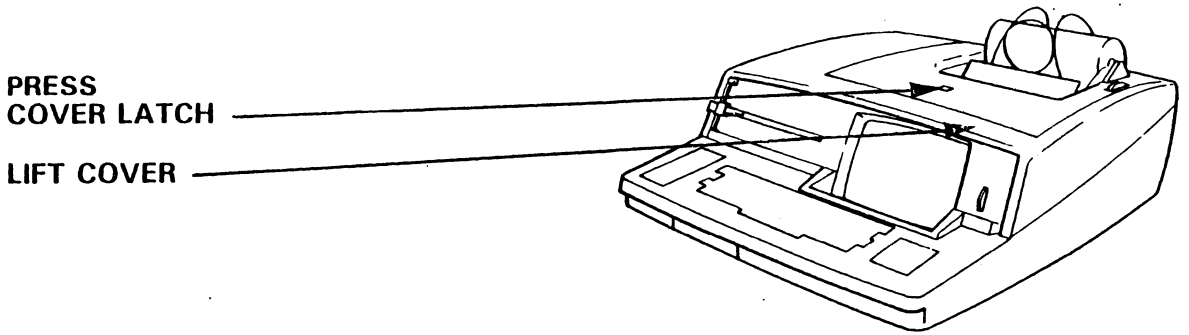
SAVING SHEEN TEAM
REMOVE OLD BOLT

CHANGING THE PAPER ROLL

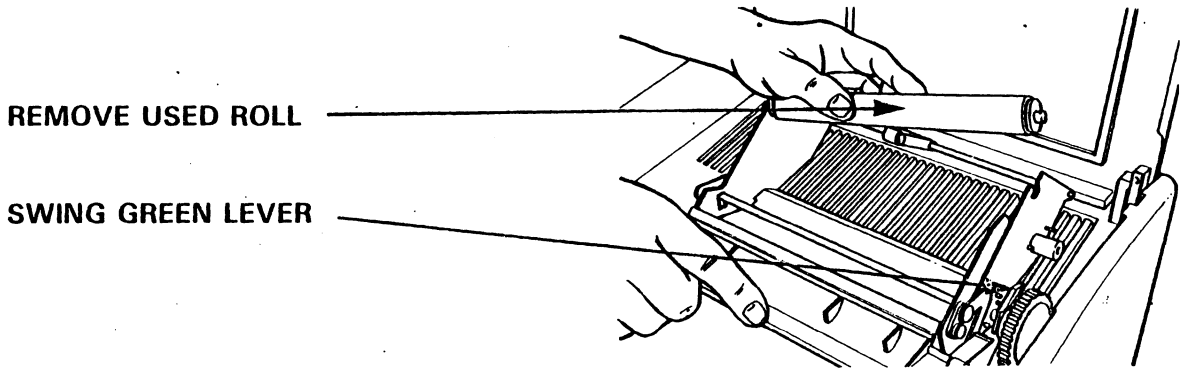
NOTE: IT IS NOT NECESSARY TO TURN OFF THE POWER.

To change the paper roll:

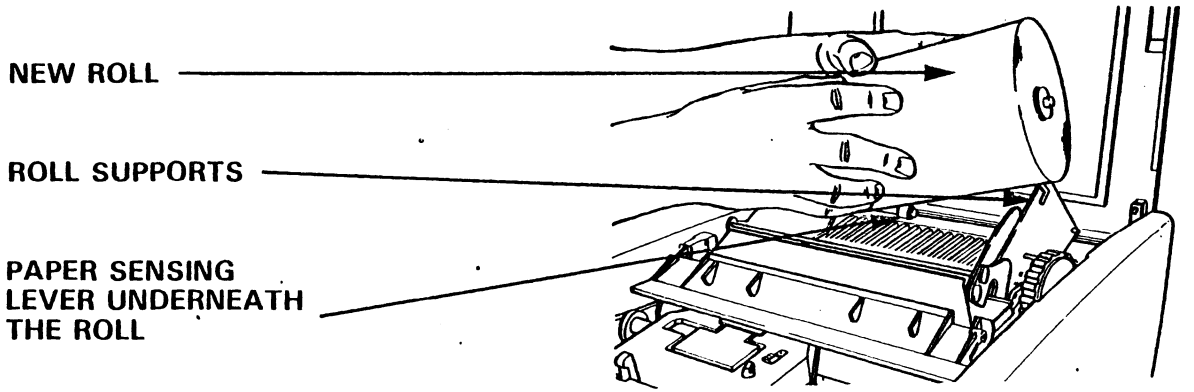
1. Press the cover latch and lift the cover.



2. Swing the green lever on the paper holder towards the front of the teleprinter and remove the used roll. Remove the spindle and insert it in the new paper roll.



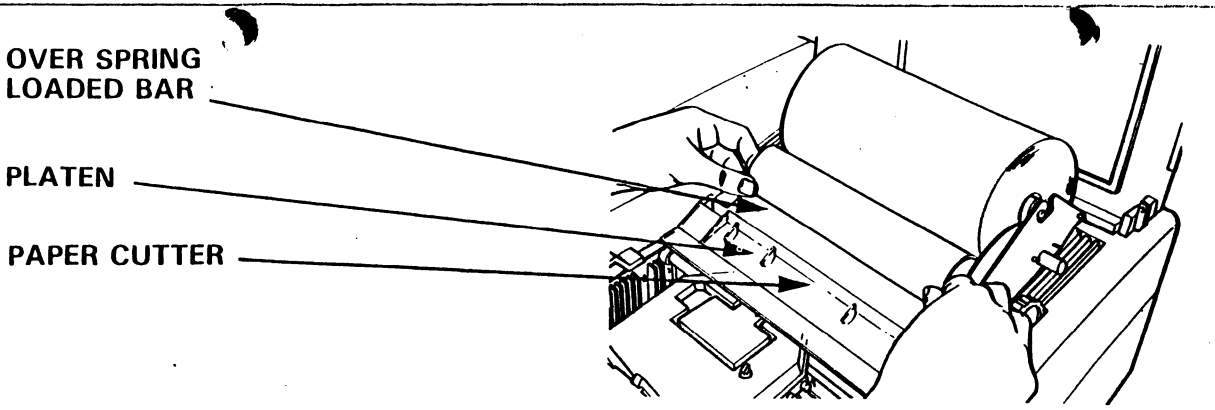
3. Set the new paper roll on the roll supports with the paper unrolling from the bottom of the roll towards the front of the machine and the black paper sensing lever underneath the roll.



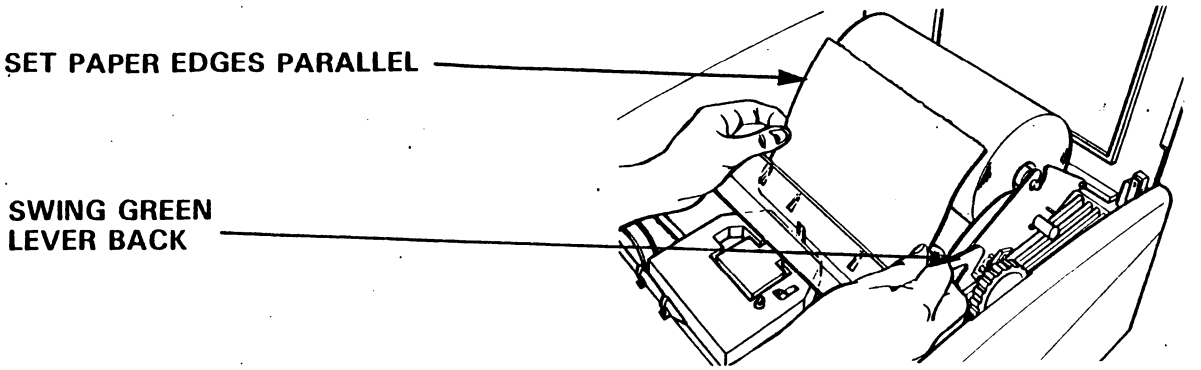
KNOB
TORN KNURLED
SWITCH
OPERATE
UNLOCK
PAPER
TEAR OFF EXCESS

TEAR BACK
SWING OVER

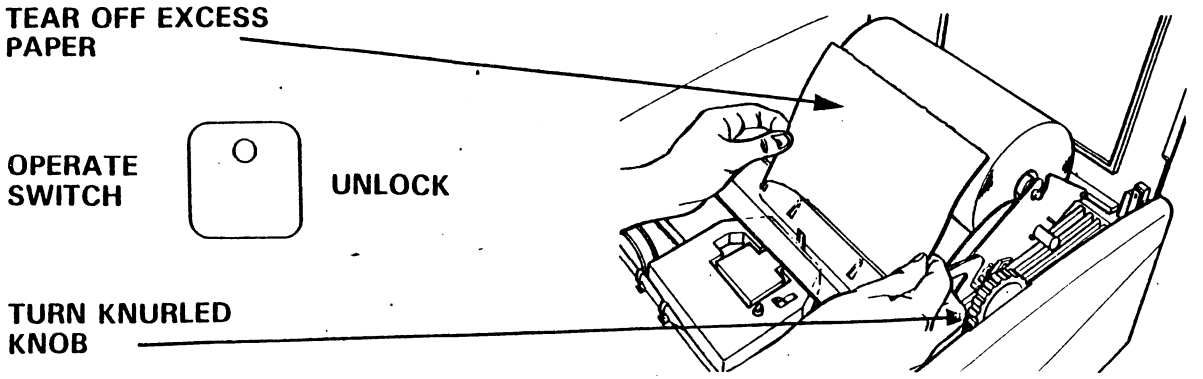
4 Pass the free end of the paper over the spring-loaded bar behind the platen and then under the paper cutter.



5 Set the paper to unroll without skewing, swing the green lever towards the back of the teleprinter and close the cover.



6 Tear off excess paper along the paper cutter, operate the UNLOCK switch and turn the knurled knob to check that paper is feeding correctly.

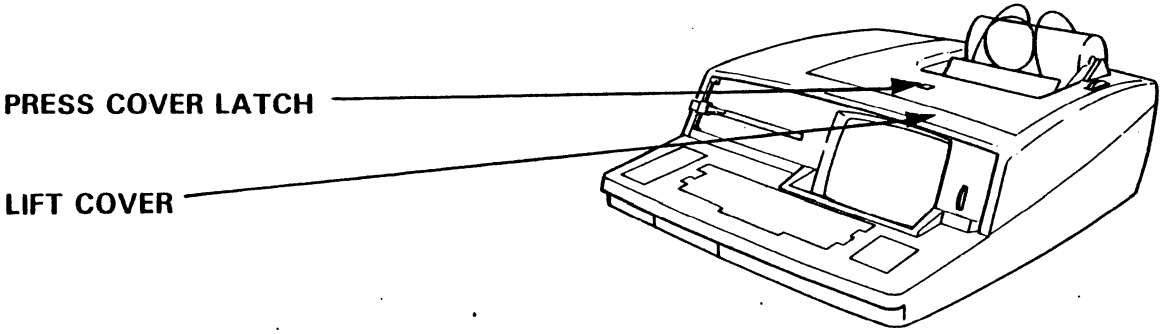


ОБМУНДИР
ПЕЛ СУВЛЮОЕ
БОЙЦ ГОСКИЙС ПЕАЕВ
ПЕЛ БУВЕЙ СОЛЕЙ

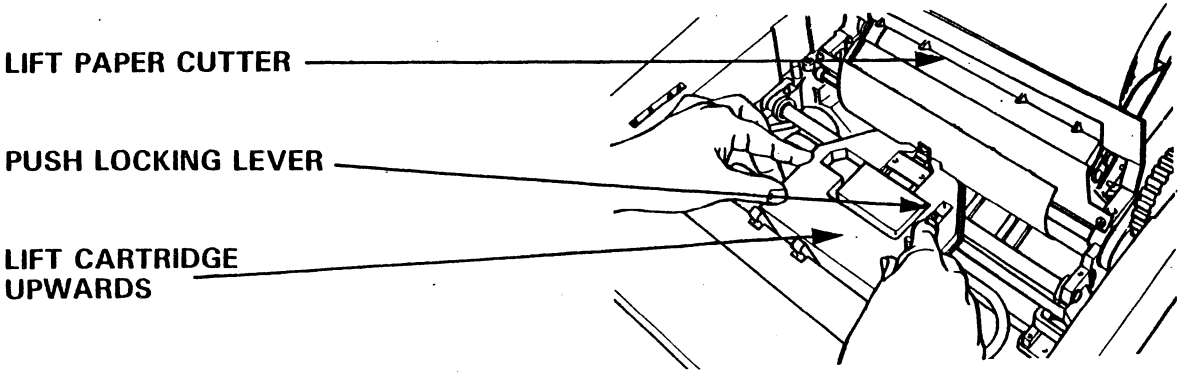
ПЕЛ СОАЕВ

If the printed image becomes too light, the ink ribbon cartridge should be changed during replacement of the next paper roll. If replacing at any other time TURN OFF THE POWER FIRST. To change the ink ribbon:

1. Press the black cover latch and lift the cover to expose the ink ribbon cartridge.



2. Lift the plastic paper cutter, push the locking lever in the direction of the arrow and lift the cartridge upwards.

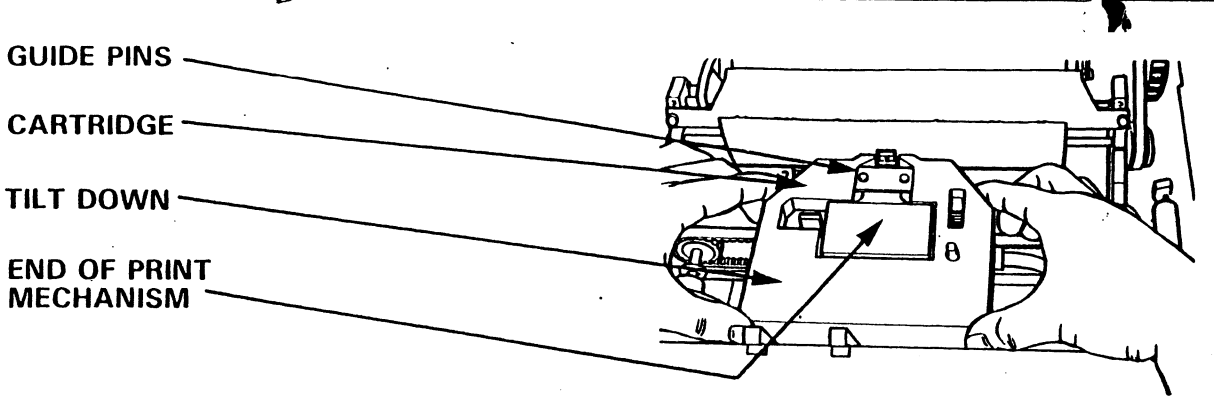


WAYNESBURG
NORTH OF
SOUTH SWITCH
SWITCH
SIGNAL

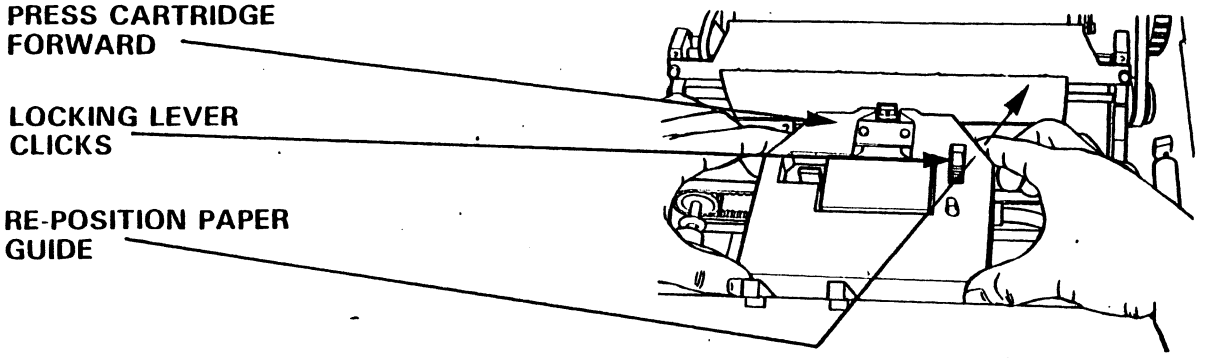
GUIDE
NORTH MAIN TRACK
SIGNAL
LOCATION OF STAND
SIGNAL
LOCATION OF STAND

SIGNAL
LOCATION OF STAND

3. Hold the new cartridge with the name upwards and engage it on the two guide pins. Tilt the top edge of the cartridge downwards to position the exposed ribbon in front of the end of print mechanism.

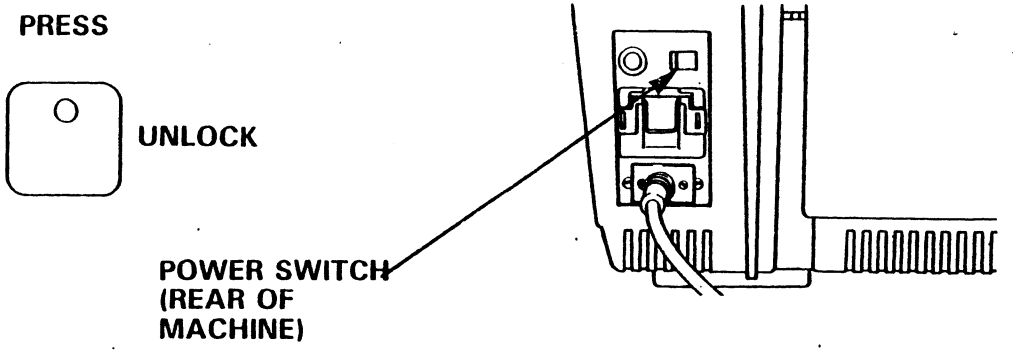


4. Press the cartridge towards the back of the teleprinter until the locking lever clicks into place, and then reposition the paper guide.



5. If the paper is low, change the paper roll, replace the cover and press the UNLOCK switch to restore normal operation.

6. If necessary, turn the machine power switch back ON.



HOLD
DOWN-SWING LOAD
COIL MOVE
UP-WARD
BACK HEAVY

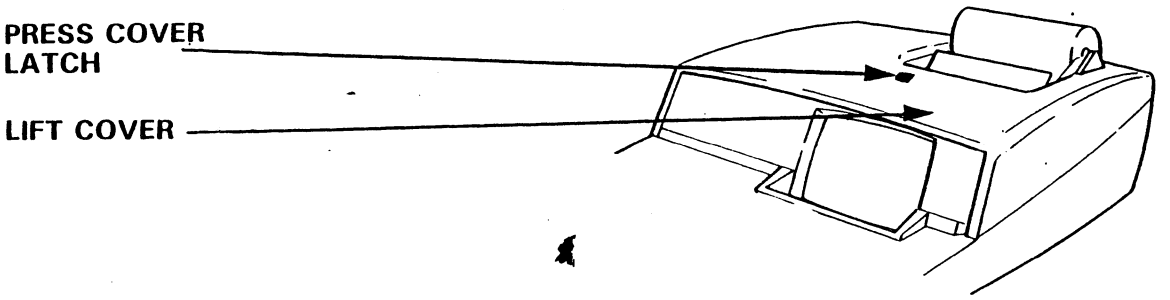
FULL CRANE
EMPTY
HEAVY BACK

ADJUSTING THE PRINTING IMPACT

The pressure of the printing mechanism may be adjusted to suit the needs of multi-copy paper rolls or single copy paper rolls.

To adjust the printing impact:

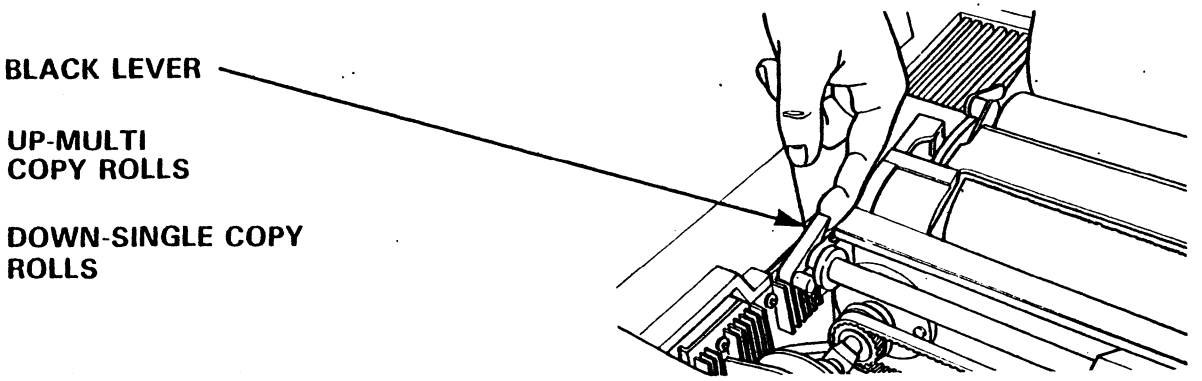
1. Press the black cover latch and lift the cover.



2. For multi-copy rolls, lift the black lever upwards.

For single-copy rolls push the black lever downwards.

3. Close the cover.



TELEPRINTER

TX 35

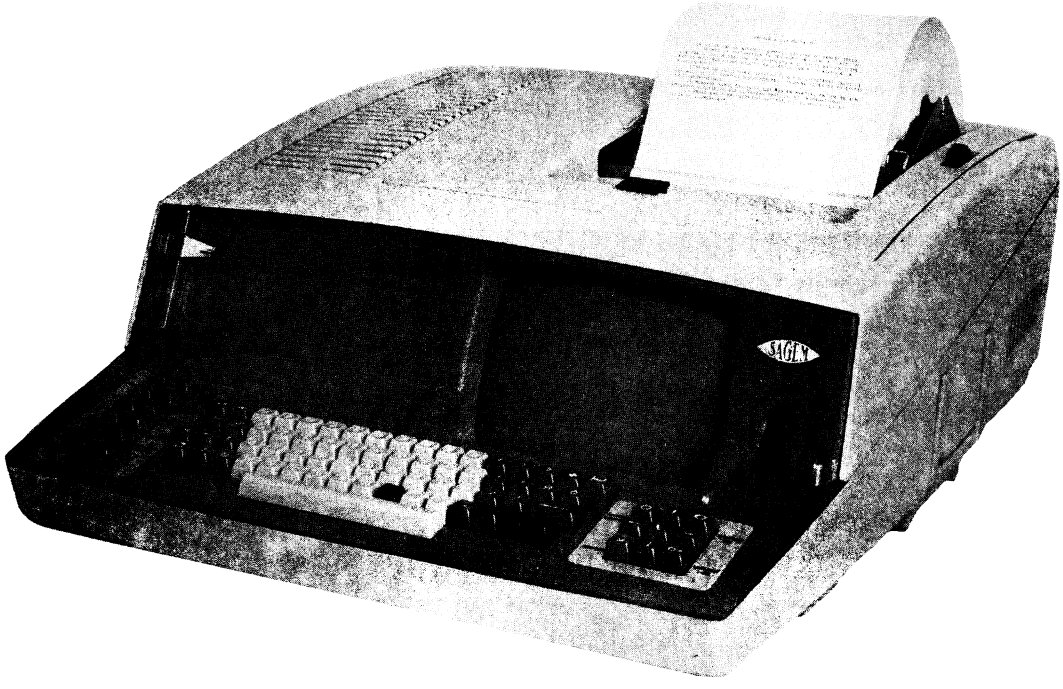
SERVICING TECHNICAL DOCUMENT

TECHNICAL DESCRIPTION

MAINTENANCE MANUAL

ILLUSTRATED CATALOGUE

SAGEM



TELEPRINTER TX35

FOREWORD

The TX 35 teleprinter SITE TECHNICAL DOCUMENT is in three parts :

1 - Description
2 - Maintenance Guide
3 - Illustrated parts list.

The foreword to the latter is in four languages : French, English, German and Spanish.

1

TECHNICAL DESCRIPTION

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1 GENERAL

The TX 35 unit is a compact TELEPRINTER with a DISPLAY SCREEN and a MEMORY. It is a TERMINAL designed for use with a communications network.

The TX 35 is of the typewriter type enabling preparation of messages on a display screen, immediate or later transmission of messages, and reception.

When the unit is energised but not in use, after a few minutes, it automatically switches over to STANDBY, which considerably reduces electrical consumption. In the standby mode, RECEPTION of a signal or LOCAL UTILISATION, immediately and automatically switches on the unit.

The memory content is safeguarded in case of a power failure.

Maintenance of the unit is facilitated by an autotest device which operates automatically when the power is switched on, or when selected by the maintenance operative.

The control logic of the electronic TX 35 unit is based on three microprocessors.

- The display screen and the memory facilitate the work of the operator. In fact, the typed text is displayed before being printed, which enables easy CORRECTION and MODIFICATION before on-line transmission.

- The unit avoids word cut-off at the end of a line. It also enables insertion of closing-up of characters, words or lines.

- The operator has fixed or programmable tabulation by means of a keyboard, with left or right-hand side centering.

- The built-in memory enables CONSERVATION of received and prepared TEXTS, and they are REUTILISABLE as required until erased by the operator.

  In addition, the memory enables the use of protected formulas.

- The prepared, received or transmitted texts are numbered automatically by the unit in order to compile the LOGBOOK which may be displayed or printed out as required. This enables rapid text scanning.

TEXT PREPARATION is compatible SIMULTANEOUSLY with message RECEPTION or TRANSMISSION.

- The network access and end of communication procedures are performed automatically or manually by the unit, as decided by the operator.

- An ABBREVIATED NUMBERING device enables the operator to simplify the call sign for frequently-called correspondents. The operator may program the abbreviated number table using the keyboard. Telex numbers of addressees are memorised and represented by a single letter from A to T (20 possibilities). After preparation of a text, the teleprinter automatically supplies the complete telex number when the single letter key is pressed.

- Messages received may be automatically recorded in the memory, if so selected by the operator.

2 TECHNICAL DATA

2.1 ADAPTATION TO A COMMUNICATIONS NETWORK

- The unit may be equipped with various electronic boards enabling adaptation to a communications network (consult us).
- Code used : CCITT N°2
- Symbols : type A, B ...
- Numbering : KEYBOARD type, dial
- Modulation speed : 50, 75 or 100 bauds.

The selector switch is located on the unit ADAPTOR board.

- Telegraphy :

  . overall arythmic distortion : < 2 %
  (without psophometric filter)

  . margin : $\geqslant 45$ %

  . insensitivity to "under 1/2 a unit departure duration" pulses.

- Line current

  . current injector for transmission

  . current regulator for reception

- Telegraphy voltages

  $\pm$ 48/50 V; $\pm$ 60 V; $\pm$ 80 V double current

  0-100 V ; 0-120 V; 0-160 V single current

2.2 DISPLAY CHARACTERISTICS

The DISPLAY SCREEN consists of a small TV tube of the following size :

- diagonal : 240 mm approx.
- effective width : 200 mm approx.
- effective height : 150 mm approx.

Image persistency and brightness may be adjusted by means of a thumbwheel accessible to the operator, giving high operating comfort. An INDEX marks the operating location (characters in progress).

Writing is in matrix form (9 x 7 points), with the following characteristics :

- number of characters per line : 69, 72 or 80 (depending on option)
- number of text lines : 20
- service line : 1
- total number of lines : 22

2.3 PRINTING CHARACTERISTICS

Printing is in matrix form, by impact (standard ECMA42)

- number of characters : 64
  : matix 7 x (5 + 4)
- definition of characters : 3 to 6 types (optional)
- size of characters :
  . height : 2.7 mm
  . width : 1.8 mm
- number of characters per line : 69
- paper drive : friction
- paper width : 210 or 216 mm
- number of copies : 1 + 3
- horizontal spacing between two characters : 2.54 mm (10 ch/inch)
- vertical spacing between two characters :
  . single line spacing : 4.2 mm (1/6 inch)
  . double line spacing : 8.4 mm (1/3 inch)

The single and double line spacing switch is located on the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

- printing speed :
  . local (maximum) : 50 ch/s
  . on line depending on modulation speed chosen

- minimum sequence for line return : one "carriage return" character plus one "interline" character.
- end of line approach audible warning : on 60th character.
- SAGEM cartridge ink ribbon.

2.4 CHOICE OF PARAMETERS (PERSONNALISATION)

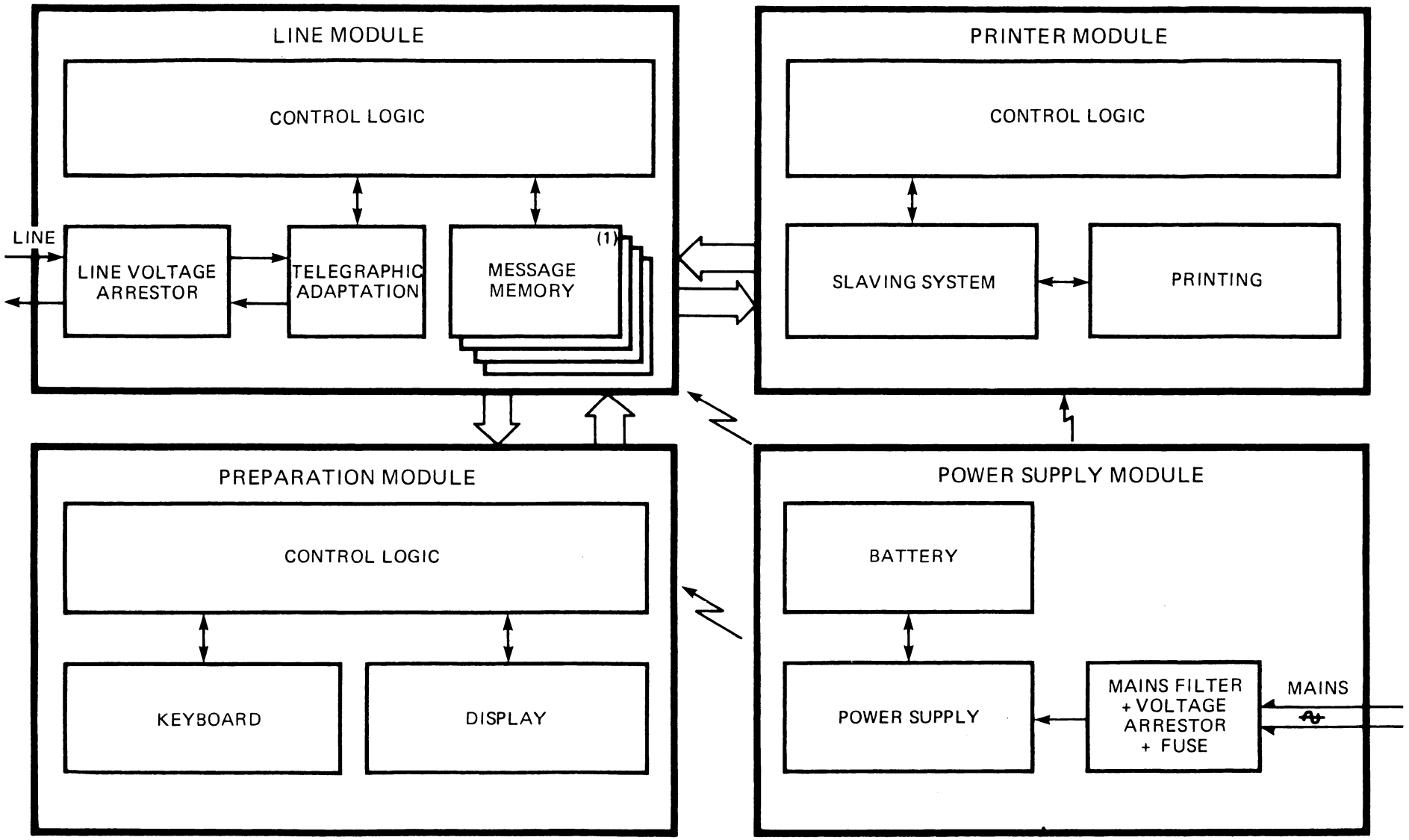
There are control switches located on the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

The main choices at the disposal of the operator are : memorisation of messages received, double or single line spacing, automatic paper release at the end of a communication.

The maintenance operative has other choices at his disposal, notably : 2-way alternating or integral 2-way communications, permanent or hold-to-operate control of the audible warning, remote control of the CALL CODE transmitter by the "D FIGURES" signals sequence, TELEPRINTER signal or CALL DIAL pulse numbering, "D FIGURES" memorisation, 2 or 3/4 wire mode operation.

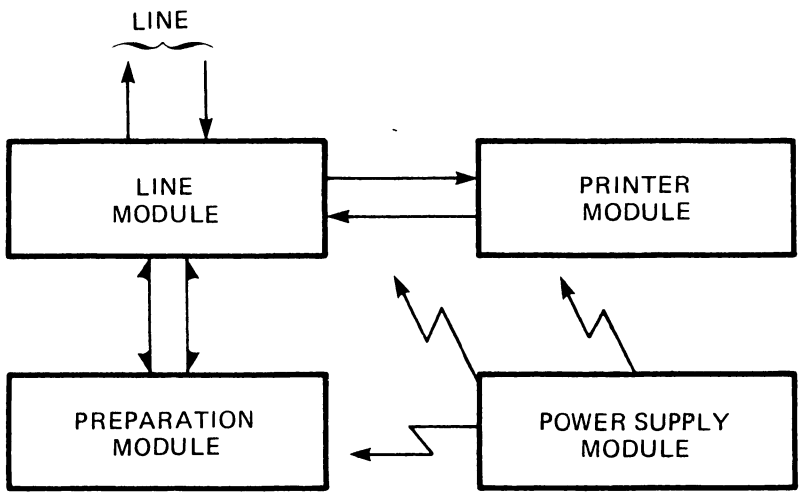
2.5 MISCELLANEOUS DATA

- Mains power supply	: 220 V ± 10 % - 50 Hz or 60 Hz ± 2 %
- Consumed power	: 130 VA in operating mode : 20 VA on standby
- Dimensions	
. width	: approx. 605 mm
. length	: approx. 705 mm
. height	: approx. 335 mm (in working order)
- Weight	: 30 kg approx.
- Environment	:
. operating temperature	: 0°C to + 45°C
. storage temperature	: - 40°C to + 70°C
- Suppression	: in accordance with standard VDE 0875 level K (conduction).



(1) 8K Bytes(and on option, 16, 32, or MAGNETIC REGISTER MEMORY operational from 70 or 140k bytes)

3 GENERAL STRUCTURE



The unit is built around the following three FUNCTIONAL MODULES : (see figures above)

1 - LINE MODULE
2 - PRINTER MODULE
3 - PREPARATION MODULE

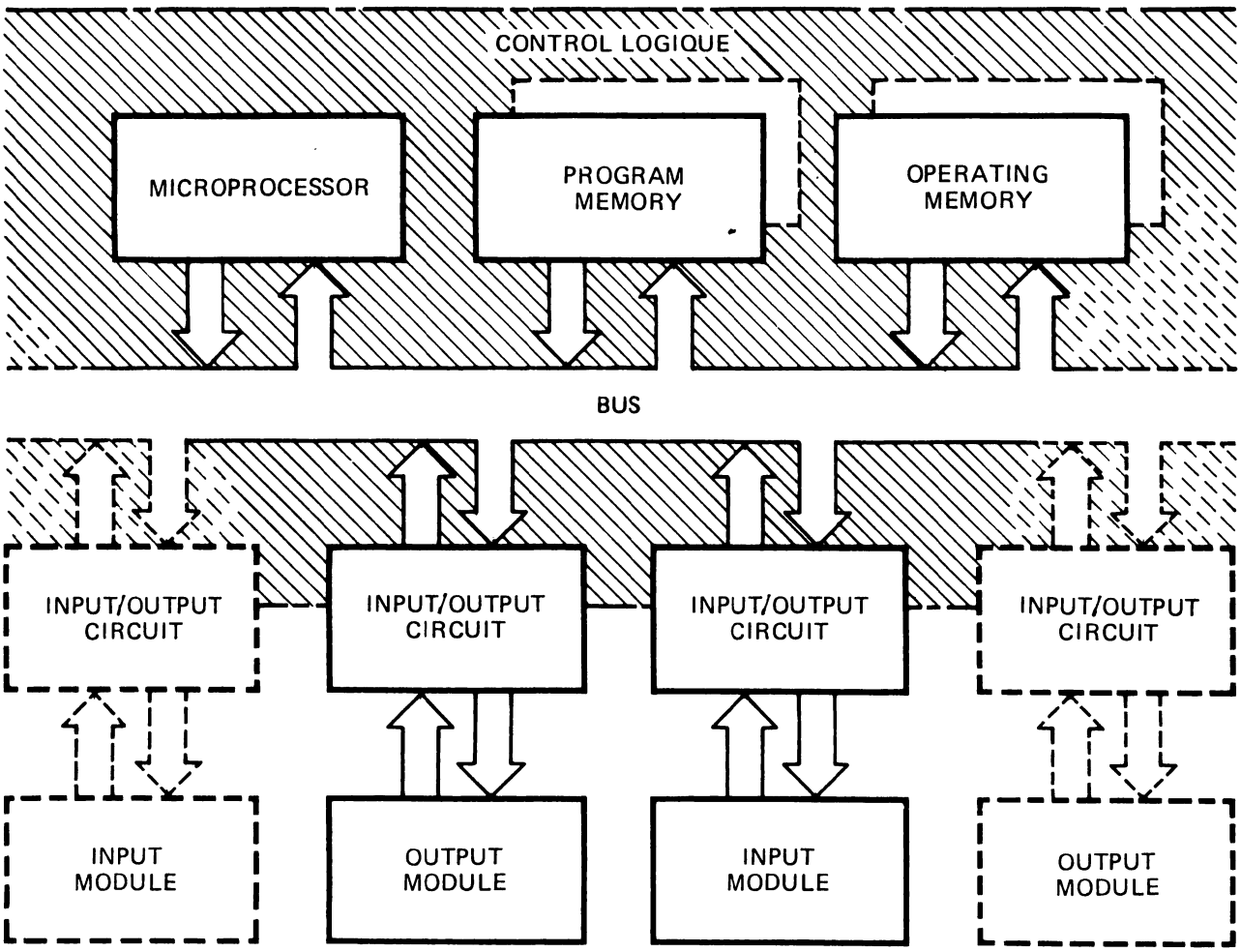
The LINE MODULE is also used for overall coordination. A POWER SUPPLY module is connected to enable operation.

Each FUNCTIONAL MODULE has its own control logic, the structure of which is identical.

The printer design is such that a maximum of functions is enabled by the electronic system.

Its breakdown is functional and modular.

The GENERAL LAYOUT DIAGRAM shows the position of the physical modules on the functional modules.



STRUCTURE OF A FUNCTIONAL MODULE

The structure of each functional module consists of :

- a microprocessor
- the associated memories (program memory and operating memory)
- the input/output circuits enabling information exchange

This system may therefore be considered as a computer system.

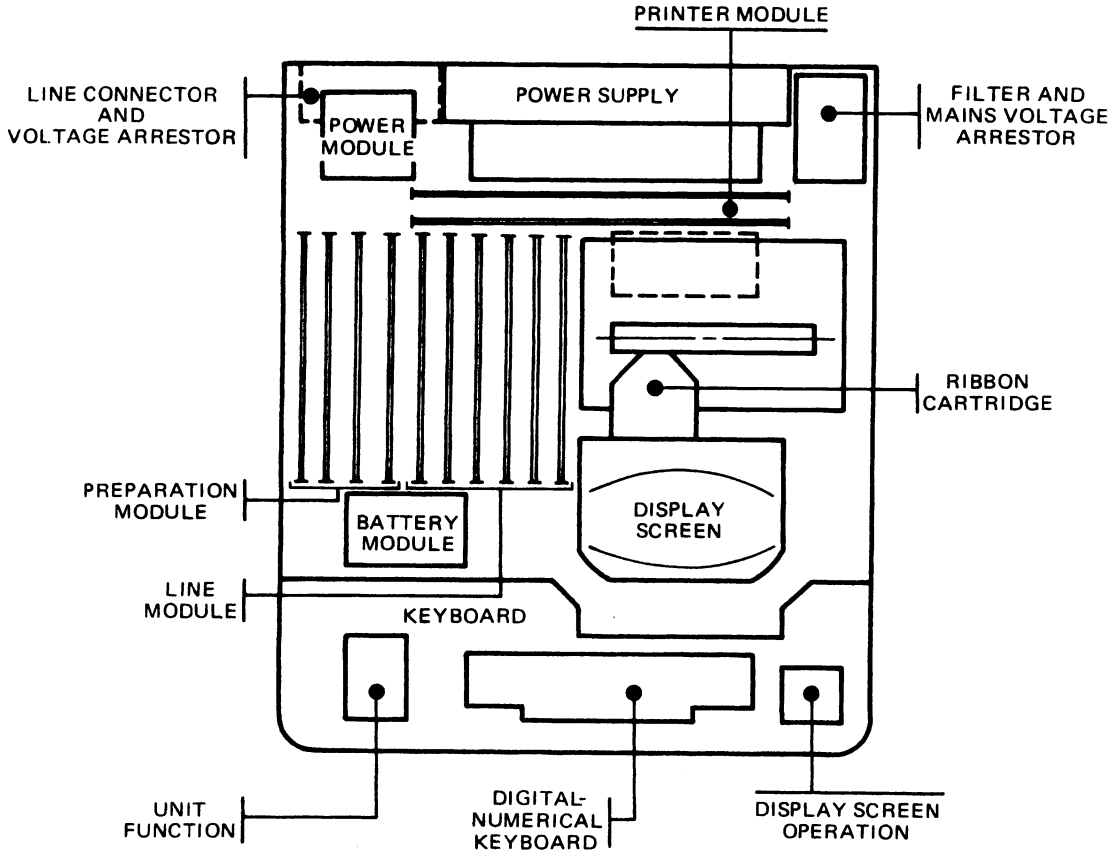
By means of the input/output circuits, this computerised structure controls a set of peripherals (input and output modules which are physical modules).

Each physical module dialogs with the BUS by means of an input/output circuit.

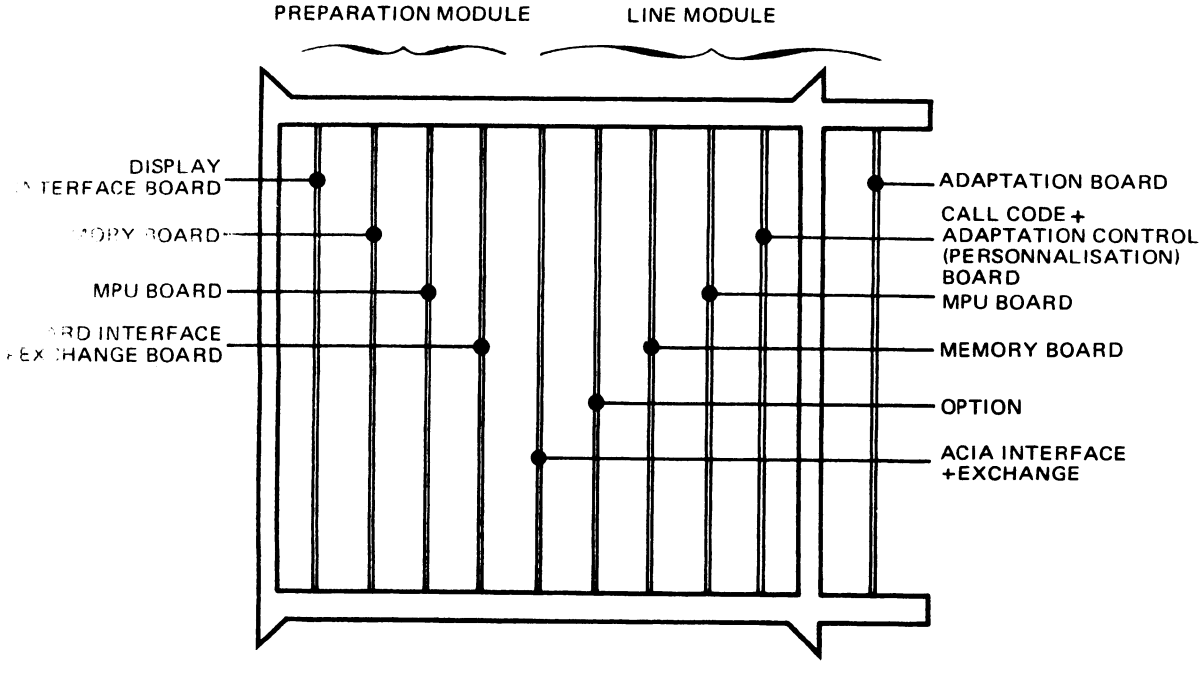
The function of the microprocessor is permanent scrutiny of the BUS state and, depending on the various states, carries out control of the sequences and data transfer between modules.

The information exchanged between the peripheral modules and the control logic consists of the following :

- status data, from the modules to the control logic
- control data, from the control logic to the modules
- data information from the input modules to the control logic and from the control logic to the output modules.



GENERAL LAYOUT



LAYOUT OF "LINE" AND "PREPARATION" ELECTRONIC BOARDS

4 COMPOSITION

4.1 COMPOSITION OF THE LINE MODULE

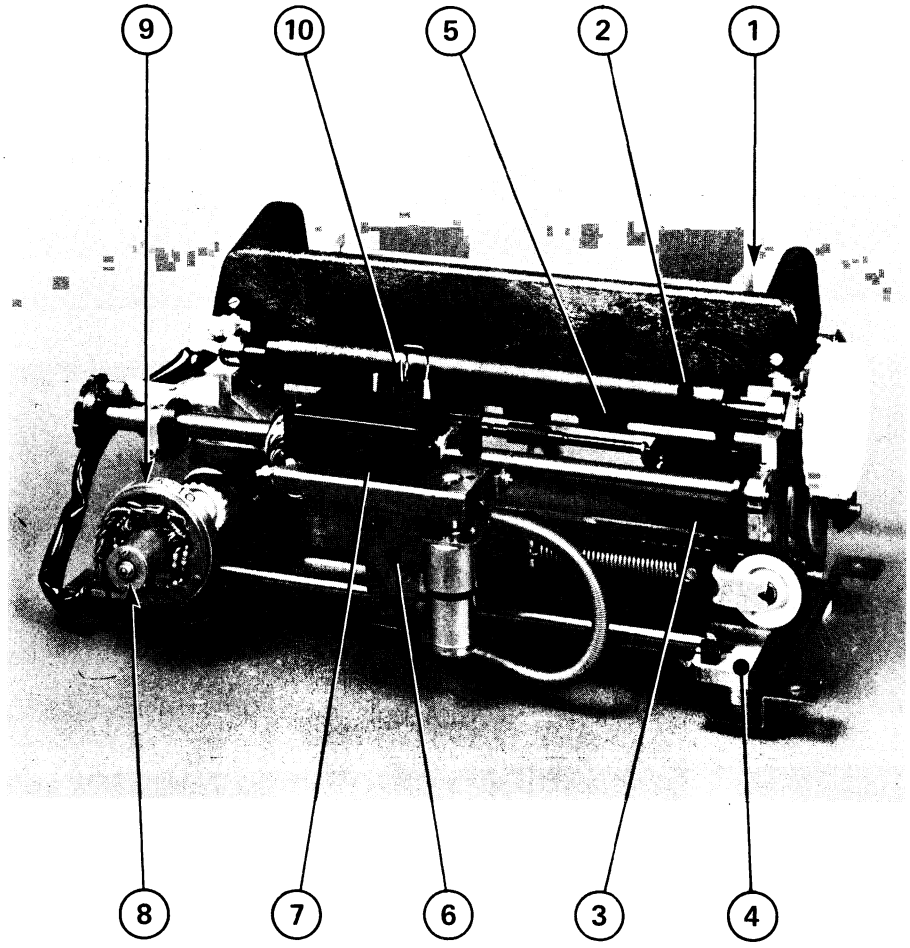
The line module comprises :

- TELEGRAPHIC ADAPTATION board
- CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board
- MPU board
- MEMORY board
- ACIA + EXCHANGE INTERFACE board
- OPTION board (eg.: additional memory
- OPERATING CONNECTION board
- LINE VOLTAGE ARRESTOR board.

4.2 COMPOSITION OF THE PREPARATION MODULE

The PREPARATION MODULE comprises :

- KEYBOARD board
- KEYBOARD INTERFACE + EXCHANGE board
- MPU board
- RAM MEMORY board
- DISPLAY SCREEN consisting of :
  - . SCREEN
  - . DISPLAY CONTROL board
- DISPLAY INTERFACE board



PRINTER CHASSIS ASSEMBLY

4.3 COMPOSITION OF THE PRINTER MODULE

The PRINTER MODULE comprises the :

- PRINTER INTERFACE board
- PRINTER MPU board
- POWER AMPLIFIER
- PRINTER CHASSIS ASSEMBLY comprised of the :

    . PAPER FEED (1)
    . ROLLER (2)
    . INTERLINE MOTOR (3)
    . CHASSIS (4)
    . PRESSURE ROLLERS (5)
    . CARRIAGE (6)
    . RIBBON CARTRIDGE (7)
    . SENSOR/CODER (8)
    . WIND-ON MOTOR (9)
    . PRINTING DEVICE (10)

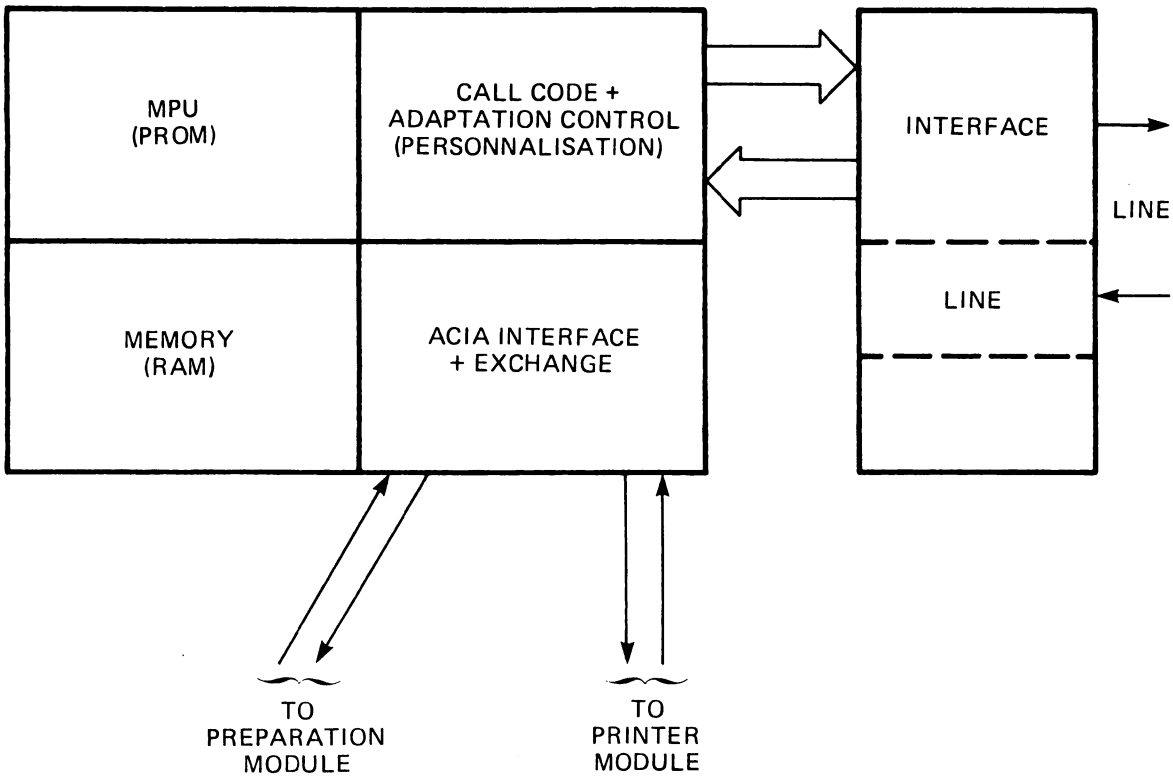
4.4 COMPOSITION OF THE POWER SUPPLY MODULE

The power supply module comprises the :

- POWER SUPPLY board
- N° 1 REGULATION board
- N° 2 REGULATION board
- MAINS FILTER
    . MAINS VOLTAGE ARRESTOR board
- BATTERY with its CHARGER and TELEGRAPH POWER SUPPLY board.

5 FUNCTIONAL DESCRIPTION

5.1 FUNCTIONAL DESCRIPTION OF THE LINE MODULE



5.1.1 General

The LINE MODULE, combined with its control logic, performs the following main functions :

- message memorisation
- call code personnalisation and control
- transmission/reception
- exchange with the other functional modules
- power supply control.

5.1.2 Message memorisation

The message memory records prepared or received texts in the RAM memories. There are two types, low or high consumption, the choice being optional.

There are one or two available locations for memory boards which offer the following choice of capacities :

- 8k bytes, or approx. 8 messages
- 14k bytes, or approx. 20 messages
- 30k bytes, or approx. 52 messages.

5.1.3 Call code personnalisation and control

The CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board enables the following in the LINE MODULE :

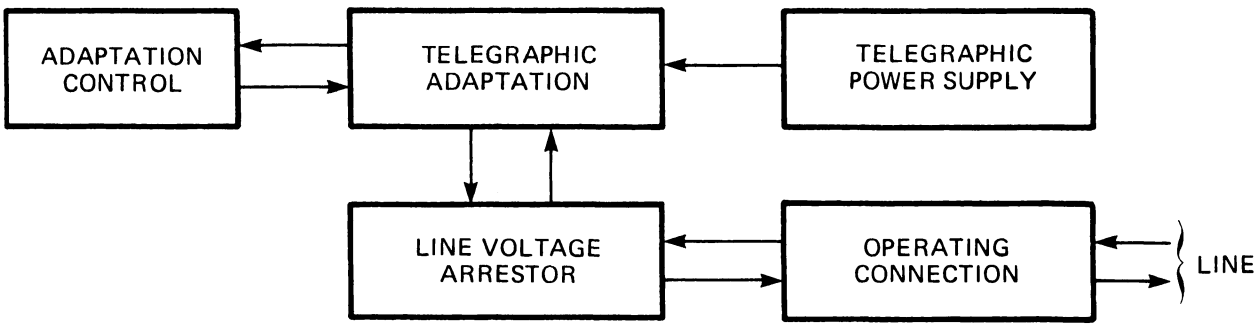
- firstly, introduction of information relating to the choice of operating parameters (see technical spec. for the board : SWITCH POSITIONING).
- secondly, transmission of the unit CALL CODE, contained in a programmable, plug-in memory. A change in CALL CODE is obtained by changing the memory.

NOTE : The call code transmitter memory is programmed using special tooling.

5.1.4 Transmission/reception

The LINE MODULE performs data transmission and reception on-line.

The LINE MODULE control logic monitors through the LINE INTERFACE, ADAPTATION CONTROL.



The LINE INTERFACE adapts the system to the electrical characteristics of the line.

The ADAPTATION and TELEGRAPHY POWER SUPPLY cut off the unit from line.

The maintenance selector switch, located on the TELEGRAPHY ADAPTATION board enables testing of the line by the network operator. In this way, the line can take on the following configurations : NORMAL*, CUT OFF, LOOPED, GROUNDED, INVERTED.

On the connector plate at the rear of the printer, there is :

. a reset to zero pushbutton enabling triggering of the AUTOTEST
. a 0/1 selector switch enabline looping of transmission onto the unit reception system in position 1 and enabling line AUTOTEST.

* TELEPRINTER or LINE.

5.1.5 Exchanges with the other Functional Modules

The LINE MODULE performs the exchanges with the PRINTER MODULE and the PREPARATION MODULE. This function is performed by the ACIA + EXCHANGE INTERFACE.

5.1.6 POWER SUPPLY MODULE control

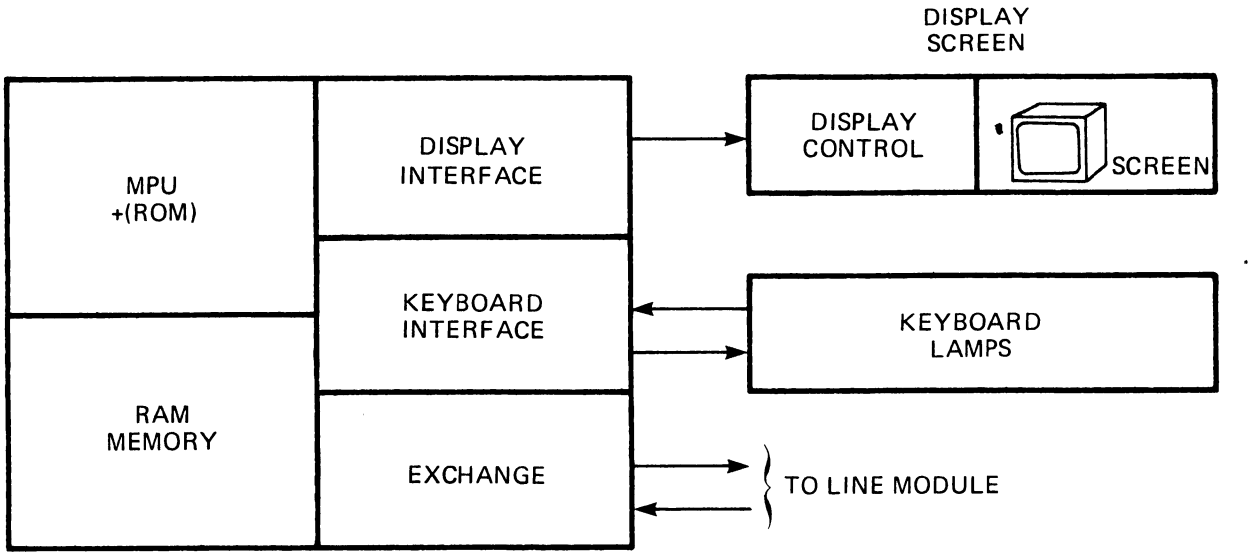
The LINE MODULE operates the STANDBY or OPERATING mode power supply.

The LINE MODULE monitors and operates the BATTERY module.

It also operates the audible warning.

These orders are given through the CALL CODE + ADAPTATION CONTROL (PERSONNALISATION) board.

5.2 FUNCTIONAL DESCRIPTION OF THE PREPARATION MODULE



5.2.1 General

The PREPARATION MODULE carries out :

- from the KEYBOARD, introduction of the characters and orders for operation of the DISPLAY SCREEN unit
- operation of the function lamps
- and also controls the DISPLAY SCREEN.

It also enables exchange of characters with the LINE MODULE which in turn, transmits them to the PRINTER MODULE where appropriate.

5.2.2 DISPLAY INTERFACE board

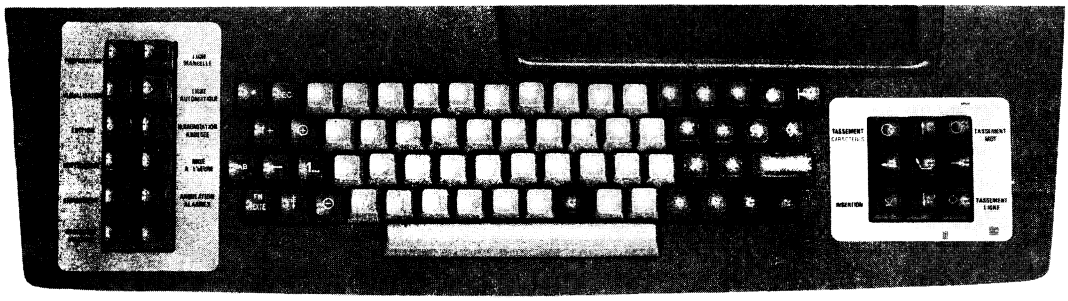
The DISPLAY INTERFACE board generates a "composite signal", adapted to a DISPLAY SCREEN, from the content of the preparation memory.

5.2.3 DISPLAY SCREEN MODULE

The DISPLAY SCREEN module consists of a DISPLAY CONTROL board and a CATHODE RAY SCREEN.

The DISPLAY CONTROL board supplies all voltages and signals required by the CATHOD RAY SCREEN from the "composite signal".

5.2.4 KEYBOARD board



TELEPRINTER OPERATION

DIGITAL-NUMERIC KEYBOARD

DISPLAY SCREEN UTILISATION

When the operator presses a key, the KEYBOARD supplies the corresponding code and also the control signals.

The KEYBOARD is of the "flat" type and consists of :

- dustproof magnetic contact keys
- an indicator light
- a keyboard coder.

Many different layouts and key symbols are possible.

5.2.5 KEYBOARD + EXCHANGE INTERFACE board

The KEYBOARD INTERFACE forms the link between the KEYBOARD and the control logic.

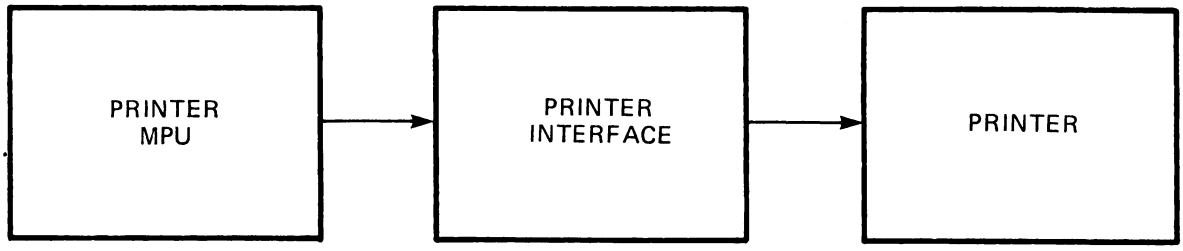
The EXCHANGE enables communication between the LINE MODULE and the PREPARATION MODULE.

5.2.6 Preparation MEMORY board

The PREPARATION MODULE MEMORY is used mainly for recording of a message during preparation, for display and the control logic.

5.3 FUNCTIONAL DESCRIPTION OF THE PRINTER MODULE

5.3.1 General



The PRINTER MODULE enables writing of messages during preparation for transmission or reception.

Three different typefaces appear on the original and on its copies :

- A locally prepared message.

  A LOCALLY PREPARED MESSAGE IS PRINTED
  IN CHARACTERS SLOPING TO THE LEFT

- A transmitted message.

  A TRANSMITTED MESSAGE IS PRINTED
  IN CHARACTERS SLOPING TO THE RIGHT

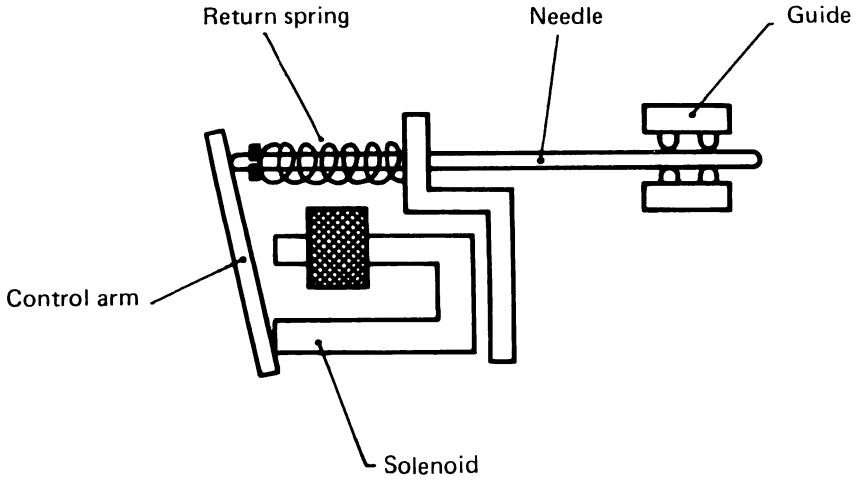
- A received message.

  A RECEIVED MESSAGE IS PRINTED
  IN UPRIGHT CHARACTERS

The PRINTER MODULE control logic order the following functions through the PRINTER INTERFACE board :

- printing
- CARRIAGE advance and return
- interline
- inking

5.3.2 Printing



Printing is by means of a mosaic type character definition of 7 lines and (5 + 4) columns. A set of points enables reconstitution of the characters.

Printing is by impact, with an inking ribbon.

The PRINTING DEVICE comprises :

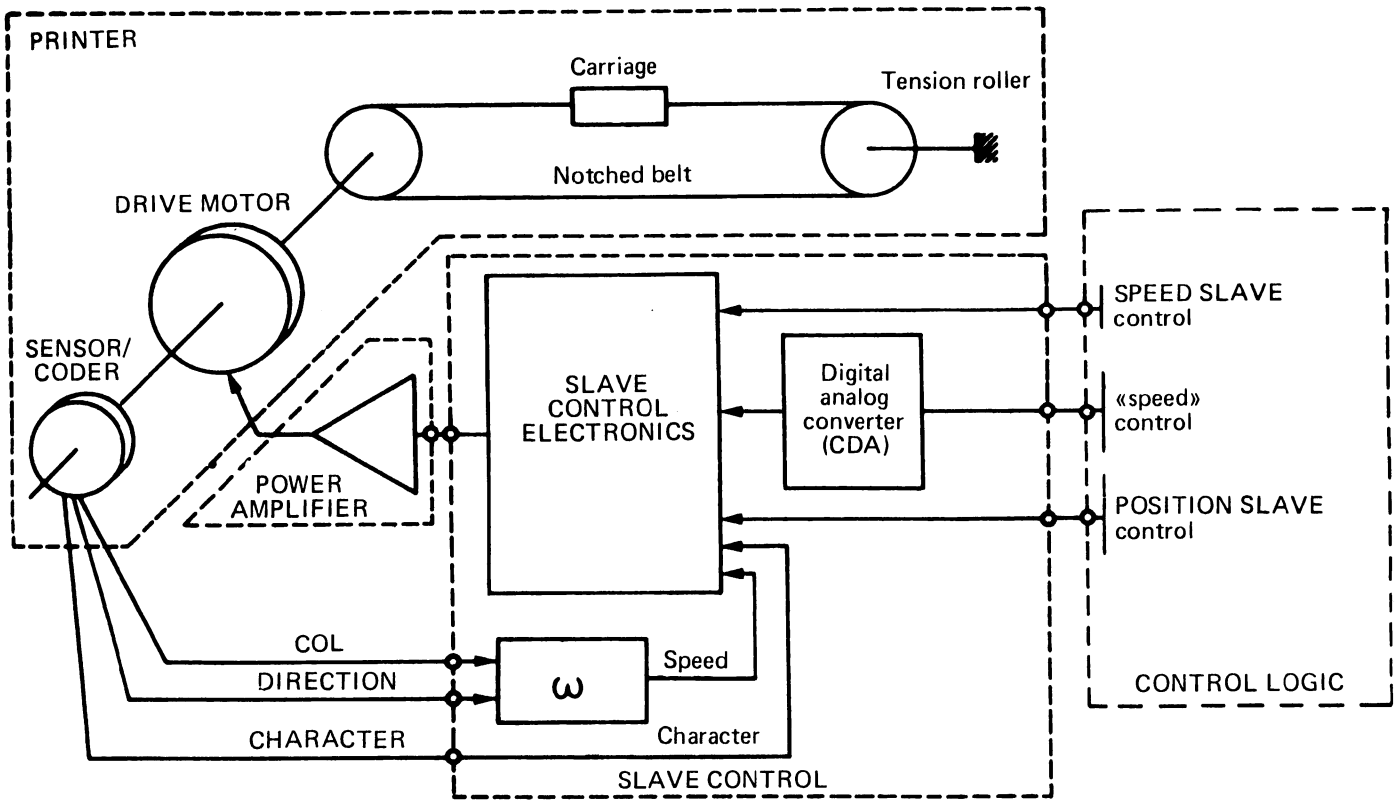
- 7 needles
- 7 control arm solenoids.

An appropriate control sequence enables printing of the character column by column, during passage of the printing device over the paper.

The needles are returned by a spring and guided at the end of the printing device system.

Depending on the number of copies or the thickness of the paper, the PRINTING DEVICE position may be adjusted by means of a thumbwheel.

5.3.3 Carriage advance and return



- the printing and the inking devices are mounted on a carriage guided along two rails.

- DRIVE MOTOR :

  The carriage advance and return to the start of the line is by means of a DC motor slaved to a SENSOR/CODER. The DRIVE MOTOR movement is transmitted to the CARRIAGE by two pullies and a notched belt. The CARRIAGE is attached to the notched belt.

- SENSOR/CODER is connected mechanically to the DRIVE MOTOR shaft. It supplies the signals for :

  . the movement direction
  . movement speed
  . carriage position.

The slave system corrects the orders given from the previous signals so that the carriage movements conform to the pre-established profiles.

5.3.4 Line spacing

The paper drive is of the friction type.

The type is applied to the PRINTING ROLLER by PRESSURE ROLLERS.

The PRINTING ROLLER rotation is by a step-by-step motor.

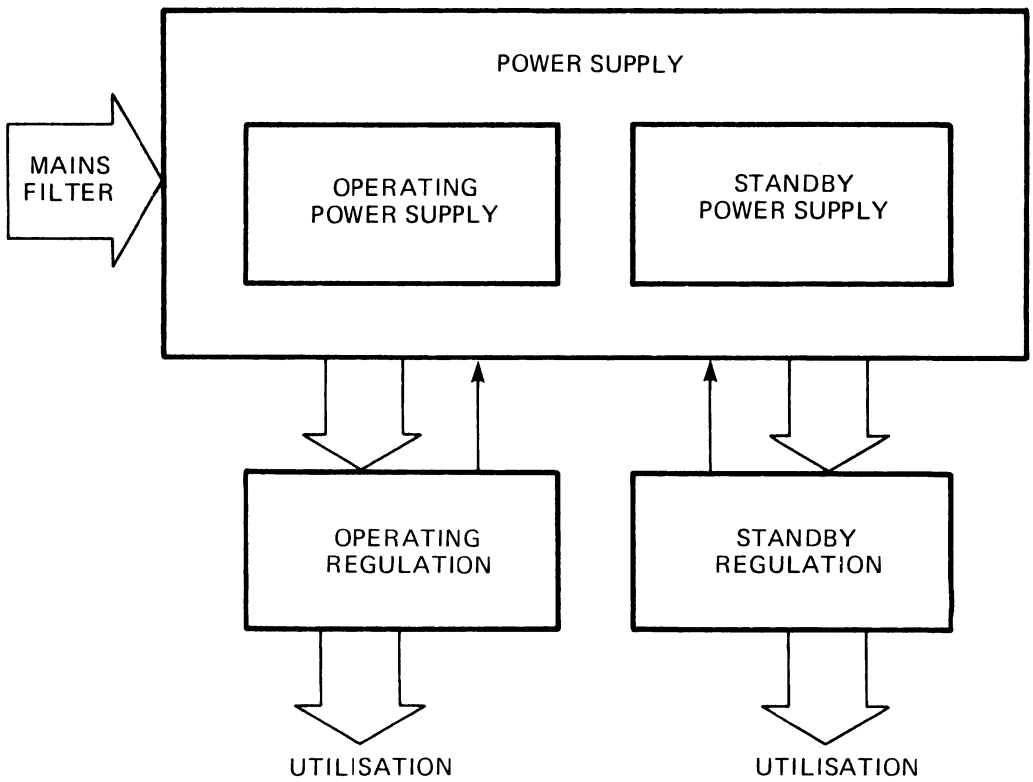
In addition, when printing is finished, the text is released from the PRINTING DEVICE, enabling it to be read.

5.3.5 Inking

A closed loop inking ribbon in a RIBBON CARTRIDGE is fed in front of the PRINTING DEVICE.

A fixed notched belt located parallel to the CARRIAGE movement drives the ribbon (forwards) by a notched wheel.

5.4 FUNCTIONAL DESCRIPTION OF THE POWER SUPPLY MODULE

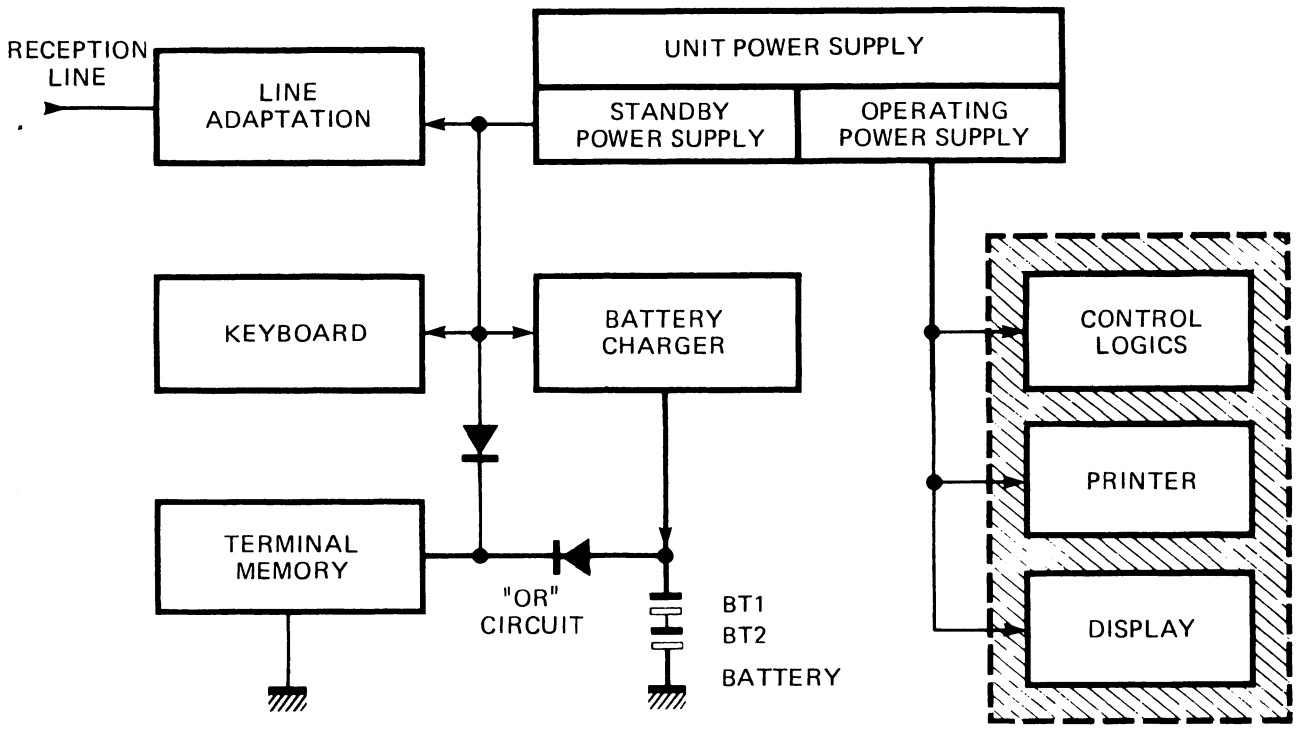


The POWER SUPPLY MODULE supplies the electrical power required for all parts of the unit from the mains.

The module is a dual system. It has two cut-out power supplies.

After a few minutes, if the unit is not used, but is energised, it automatically switches over to STANDBY which considerably reduces its electricity consumption.

In the STANDBY mode, the RECEPTION of a signal, or LOCAL UTILISATION immediately and automatically starts up the unit.

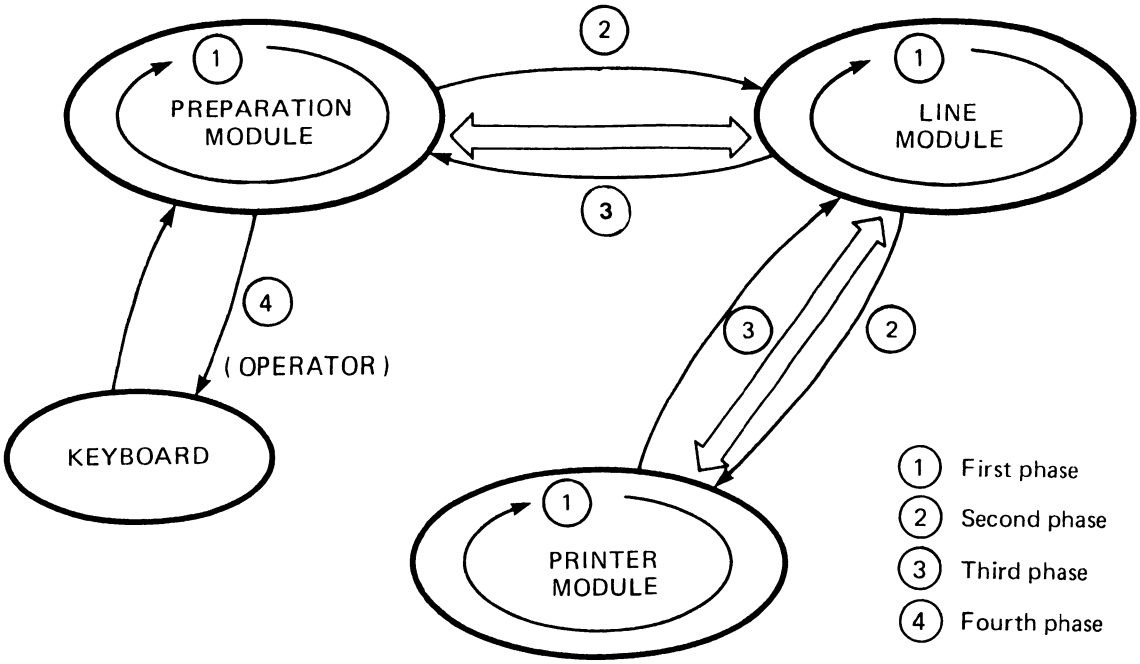


In addition, in case of a mains cut-off, there is a device enabling protection of the information stored in the teleprinter memory lasting for one hour approximately (100 hours optional).

While the unit is fed by the mains, a battery charger charges the battery (fully charged in 100 hours).

If there is a mains cut-off, the battery supplies the memory storing the information.

6 AUTOTEST DEVICE



This device enables CHECKING FOR CORRECT OPERATION of the unit when starting up and also when required by the maintenance operative.

Any anomaly is notified by the display screen, the keyboard lamps or the printer.

The autotest is in four phases :

. the first phase, the autotest for each of the LINE PREPARATION and PRINTER MODULES is performed simultaneously.
. the second phase, the PREPARATION and LINE MODULES and the LINE and PRINTER MODULES try to dialog.
. the third phase, the LINE MODULE transmits date to the PREPARATION and PRINTER MODULES and reciprocally.
. the fourth phase, the operator may test the KEYBOARD, with the code pertaining to each key being displayed after it is pressed.

NOTE : setting off of the autotest erases the memories.

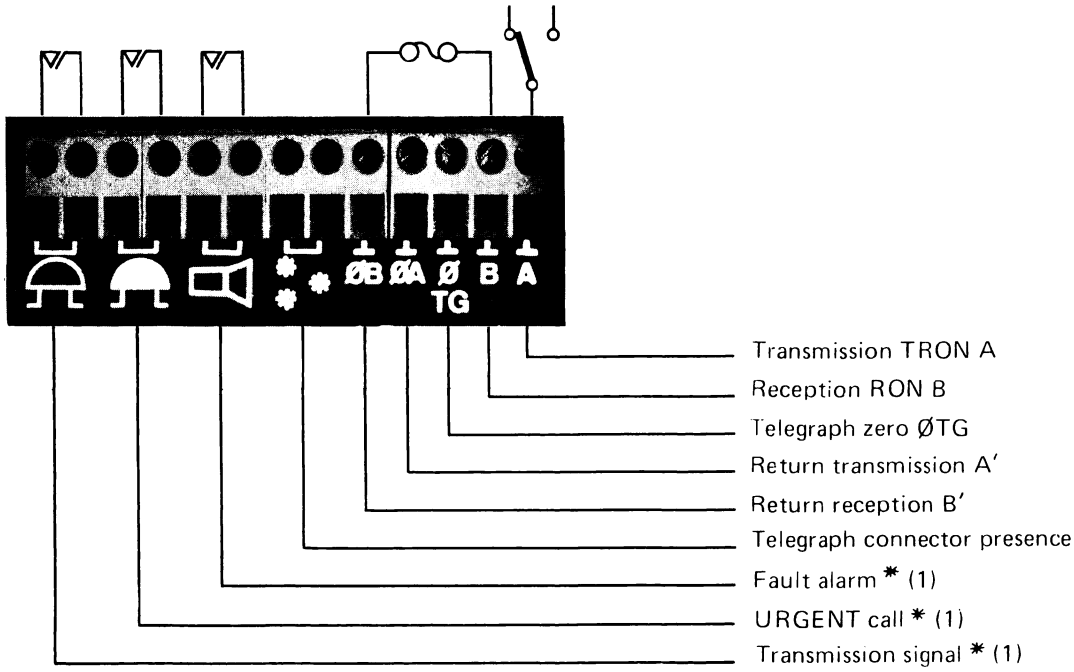
7 TELEPRINTER CONNECTION

7.1 MAINS CONNECTION

The unit is fitted with a mains cable for connection to the mains.

7.2 TRANSMISSION LINE CONNECTION

The unit is equipped with a line bar.



(1) These functions may be indicated by luminous, audible, etc., devices located on the outside of the machine. The relay contact whose characteristics are given below, are accessible on the line bar :

- maximum voltage : 100 V
- maximum intensity : 250 mA
- maximum cut-out power : 10 W
- contact resistance : < 150 m

Connection is at the rear of the unit. Refer to the technical specification sheets for :

- CONNECTIONS
- POSITIONING OF SWITCHES for the type of ADAPTATION board used.

* this function may differ, depending on the type of unit.

8 STARTING UP THE TELEPRINTER

With the teleprinter correctly connected up, turn on the START switch. The lamp comes on and the autotest is triggered off.

When the autotest is finished, the unit is ready for use.

NOTE : refer to the technical specification sheets for selection of operating parameters.

- CONNECTION
- POSITIONING OF THE SWITCHES ON·BOARDS :
  - . CALL CODE + ADAPTATION CONTROL (PERSONNALISATION)
  - . ADAPTATION.

2

MAINTENANCE MANUAL

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P L A T E S

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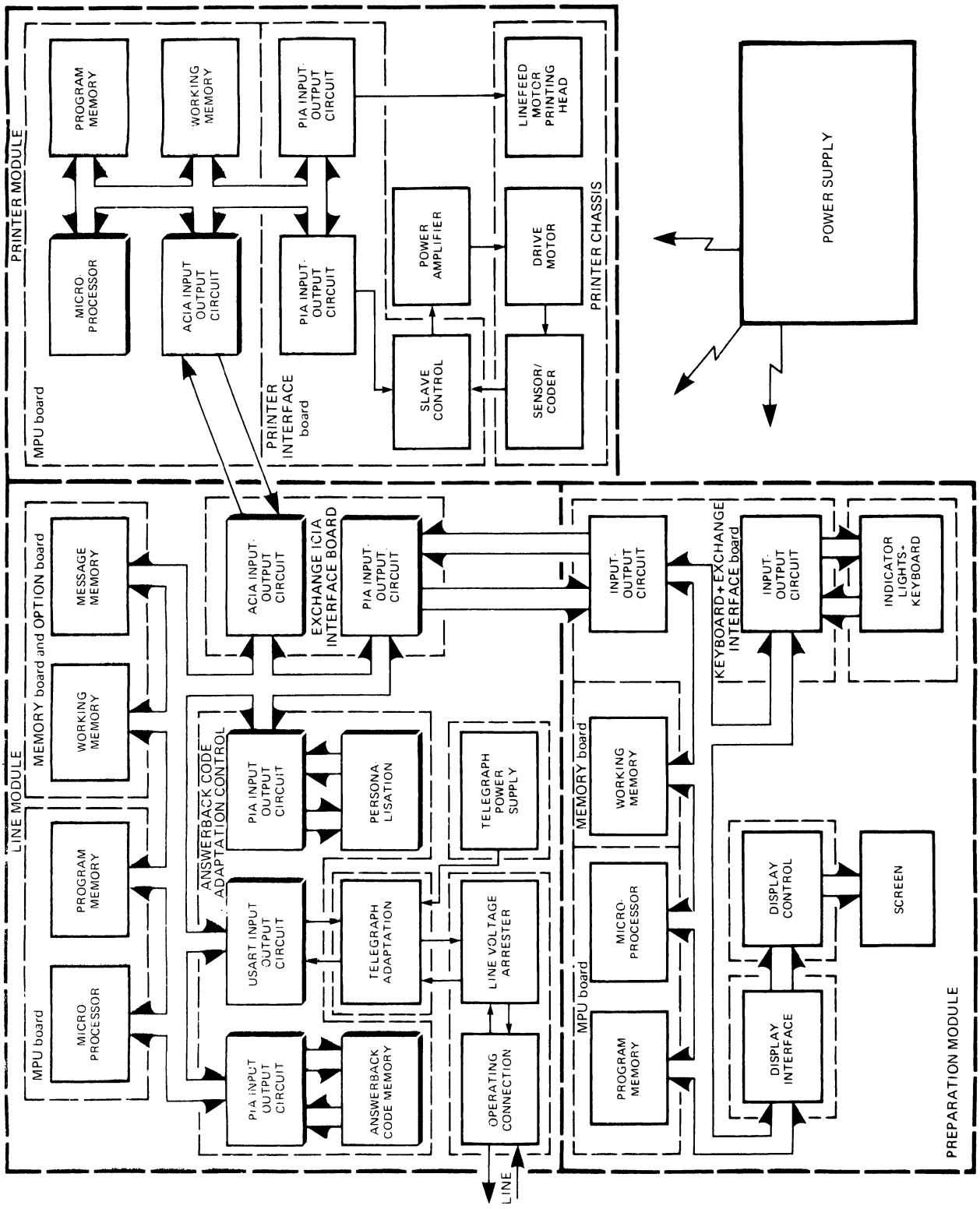
1 LOCATION OF FUNCTIONS ON MODULES



2 GENERAL

This MAINTENANCE GUIDE is designed to aid the technician on the operating location.

Each function may use several of the machine constituent modules.

The procedure is as follows :

- trip the SELF-TEST,
- check for any faulty function,
- check for faulty modules,
- replace them by following the instructions given in the MODULE REMOVAL AND INSTALLATION chapter,
- check correct operation using the SELF-TEST, before TURNING THE UNIT BACK ON.

3 SELF-TEST

3.1 PRELIMINARY OPERATIONS

Before setting off the self-test :

- printing out of the message memory content (if possible),
- checking :
  . that the boards are correctly plugged in,
  . that the cords are properly connected.
- putting the O/1 selector switch on 1,
- CARRIAGE travel to the right, to the end of the line,
- checking of paper supply.

3.2 SETTING OF THE SELF-TEST

Press the "RAZ" (RESET) button on the back of the unit. The unit reacts in the following manner when operation is correct :

- the printer starts up (the carriage goes to the left stop),
- the "display screen" is activated (the screen is filled with □'s),
- the indicator lights come on for 1 second,
- the following results are displayed and printed in the following order:
  . reference number of software corresponding to each of the PRINTER, PREPARATION and LINE MODULES,
  . character check phrase (simple line of upright writing is displayed),
  . checking of "site" options (choice of operating parameters, using the ANSWERBACK CODE + ADAPTATION order board (PERSONNALISATION),
  . the machine answerback code,
  . line test *.

- when testing the KEYBOARD,pressing a key results in the display of the corresponding code, and preceded, where applicable, by the relevant symbol.

See examples of displayed and printed information, and also key coding, in the following pages.

*If the ADAPTATION board has the "with ground feedback" option.

3.3 DISPLAYED INFORMATION

DISPLAY SELF-TEST FINISHED

PRINTER MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
PREPARATION MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
LINE MODULE..... : TESTS FINISHED-PROGRAM : 23 .....

DISPLAY TEST

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890%ÉH'()+,-./:=?

SITE OPTIONS

ANSWERBACK CODE :

LINE TEST

YRYRYRYRYRYRYRYRYRYRYRY.....RYRY (69 characters)
RYRYRYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRYRY.....Y
RYRYRYRYRYRYRY.....Y
YRYRYRYRYRYRY.....Y
RYRYRYRYRYRY.....Y
YRYRYRYRYRY.....Y
RYRYRYRYRY.....Y
YRYRYRYRY.....Y
RYRYRYRY.....Y
YRYRYRY.....Y
.....
.....
.....
RYRY
YRY
RY
Y

KEYBOARD TEST (for example : press key A)

0 1 1 0 0 0 0 1

3.4 PRINTED INFORMATION

PRINTED MODULE..... : TESTS FINISHED-PROGRAM : 23 .....
PREPARATION MODULE.... : TESTS FINISHED-PROGRAM : 23 .....
LINE MODULE..... : TESTS FINISHED-PROGRAM : 23 .....

PRINTED TEST :

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH'()+,-./:=? (characters sloping to left)
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH'()+,-./:=? (characters upright)
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890%ÉH'()+,-./:=? (characters sloping to right)

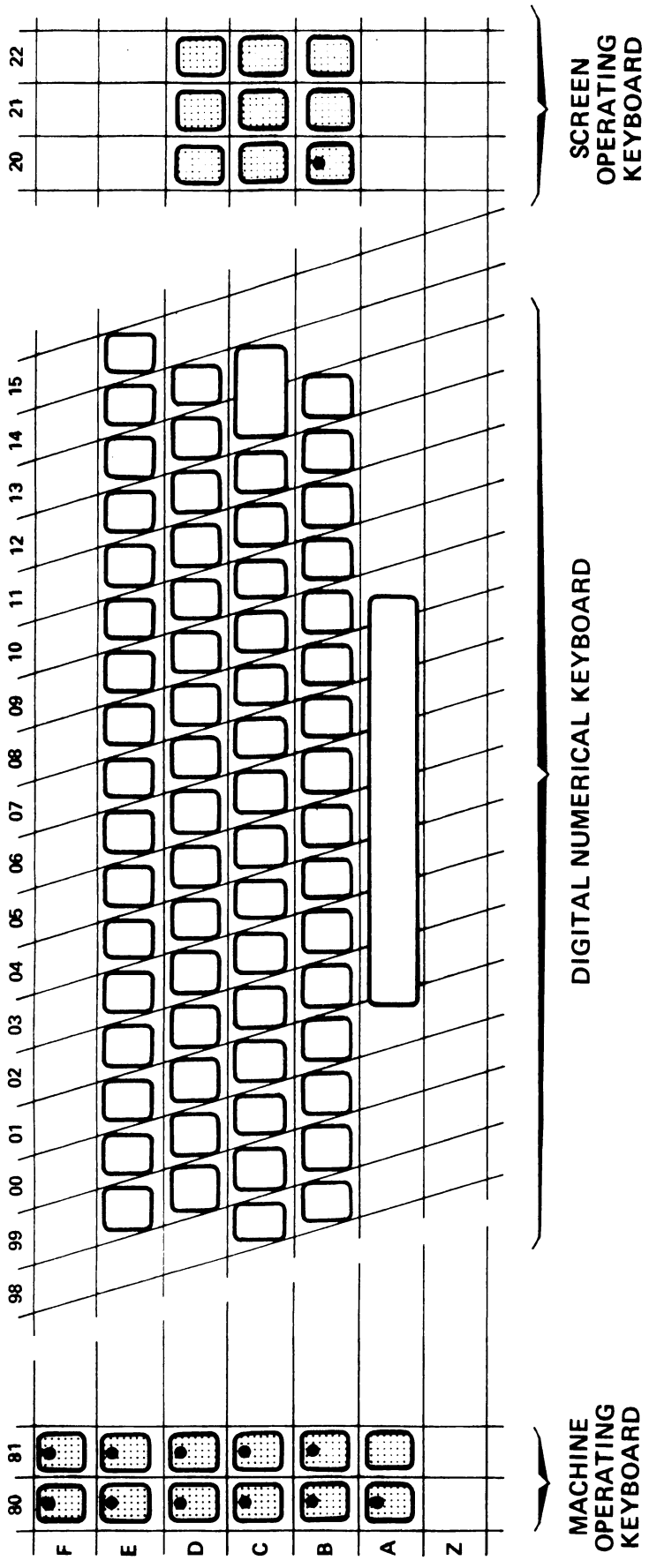
SITE OPTIONS : 00000000

ANSWERBACK CODE : SAGEM TX35

LINE TEST ..... :

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR
YRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR
RYR

3.5 KEY ARRANGEMENT



3.6 KEY CODING

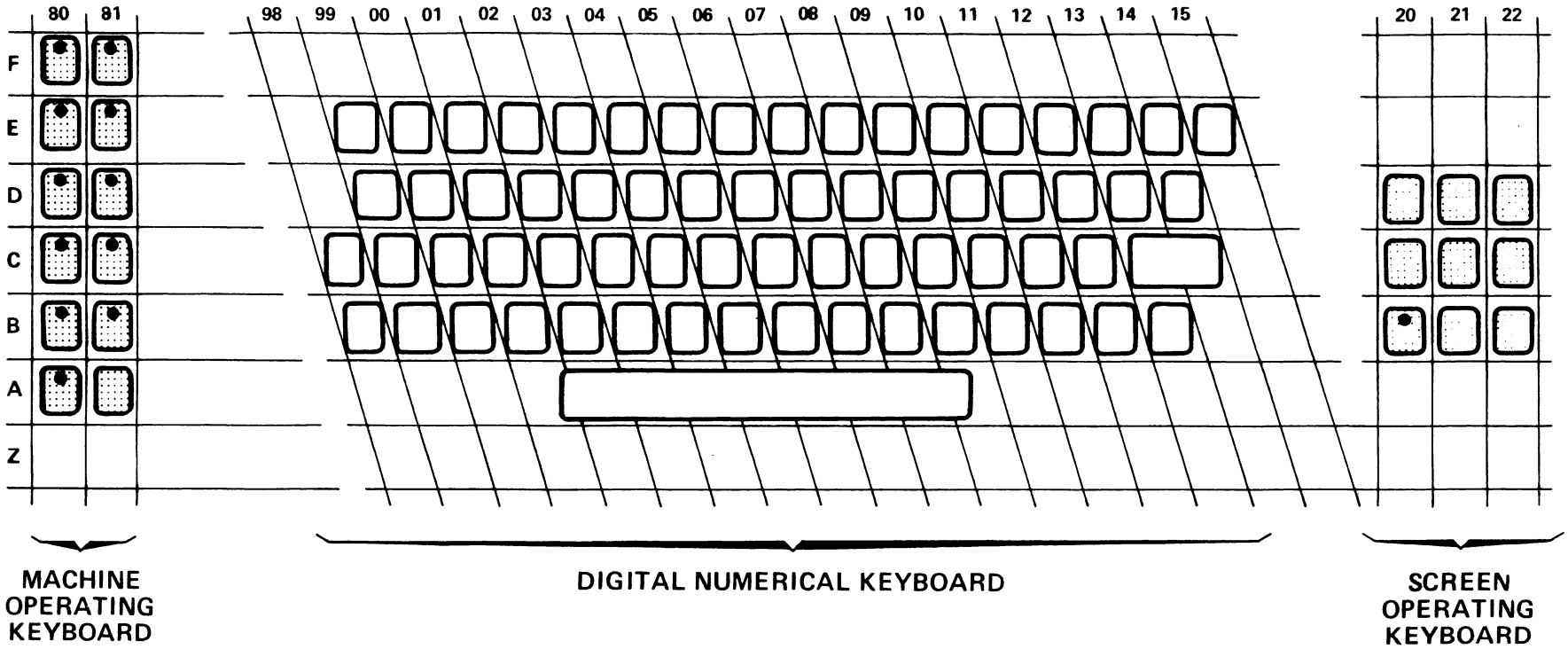
3.6.1 Digital numerical keyboard

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
A02 to 08	1	0	1	1	1	0	1	0
B 98	1	0	1	0	1	1	1	0
B 99	1	0	1	1	1	0	0	0
B 00	1	0	1	0	1	0	1	1
B 01	1	0	1	1	0	1	0	1
B 02	1	0	1	0	1	0	1	0
B 03	1	0	1	1	0	1	0	0
B 04	1	0	1	0	1	0	0	1
B 05	1	0	1	1	0	0	1	1
B 06	1	0	1	0	1	0	0	0
B 07	1	0	1	1	0	0	1	0
B 08	1	0	1	0	1	1	0	0
B 09	1	0	1	1	0	1	1	0
B 10	1	0	1	0	1	1	0	1
B 11	1	0	1	1	0	1	1	1
B 12	1	0	1	0	1	1	1	1
B 13	1	0	1	1	1	0	0	1

COORDINATES OF KEY PRESSED	CODE FO KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
C 98	1	0	0	1	1	0	1	0
C 99	1	0	1	0	0	1	0	0
C 00	1	0	0	1	0	1	1	1
C 01	1	0	1	0	0	0	0	1
C 02	1	0	0	1	0	1	1	0
C 03	1	0	1	0	0	0	0	0
C 04	1	0	0	1	0	1	0	1
C 05	1	0	0	1	1	1	1	1
C 06	1	0	0	1	0	1	0	0
C 07	1	0	0	1	1	1	1	0
C 08	1	0	0	1	1	0	0	0
C 09	1	0	1	0	0	0	1	0
C 10	1	0	0	1	1	0	0	1
C 11	1	0	1	0	0	0	1	1
C 12	1	0	0	1	1	0	1	1
C13 and C14	1	0	1	0	0	1	0	1

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
D 99	1	0	0	0	0	1	1	1
D 00	1	0	0	1	0	0	0	1
D 01	1	0	0	0	0	1	1	0
D 02	1	0	0	1	0	0	0	0
D 03	1	0	0	0	0	1	0	1
D 04	1	0	0	0	1	1	1	1
D 05	1	0	0	0	0	1	0	0
D 06	1	0	0	0	1	1	1	0
D 07	1	0	0	0	0	0	0	0
D 08	1	0	0	0	1	0	1	0
D 09	1	0	0	0	0	0	0	1
D 10	1	0	0	0	1	0	1	1
D 11	1	0	0	0	0	0	1	0
D 12	1	0	0	0	1	1	0	0
D 13	1	0	0	0	0	0	1	1
D 14	1	0	0	0	1	1	0	1

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
E 99	1	1	0	0	0	0	1	1
E 00	1	1	0	0	1	1	0	1
E 01	1	1	0	0	0	0	1	0
E 02	1	1	0	0	1	1	0	0
E 03	1	1	0	0	0	0	0	1
E 04	1	1	0	0	1	0	1	1
E 05	1	1	0	0	0	0	0	0
E 06	1	1	0	0	1	0	1	0
E 07	1	0	1	1	1	1	0	0
E 08	1	1	0	0	0	1	1	0
E 09	1	0	1	1	1	1	0	1
E 10	1	1	0	0	0	1	1	1
E 11	1	0	1	1	1	1	1	0
E 12	1	1	0	0	1	0	0	0
E 13	1	0	1	1	1	1	1	1
E 14	1	1	0	0	1	0	0	1
E 15	1	1	0	0	1	1	1	0



INDICATOR LIGHT KEYS

3.6.2 Machine operating keyboard

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
A 80	1	0	1	1	0	0	0	1
A 81	1	0	1	1	1	0	1	1
B 80	1	1	0	1	1	0	0	0
B 81	1	1	0	1	1	0	0	1
C 80	1	1	0	1	0	1	1	0
C 81	1	1	0	1	0	1	1	1
D 80	1	1	0	1	0	1	0	0
D 81	1	1	0	1	0	1	0	1
E 80	1	1	0	1	0	0	0	1
E 81	1	1	0	1	0	0	0	0
F 80	1	1	0	1	0	0	1	1
F 81	1	1	0	1	0	0	1	0

3.6.3 Screen operating keyboard

COORDINATES OF KEY PRESSED	CODE OF KEY PRESSED							
	WORD 1	B 0	B 1	B 2	B 3	B 4	B 5	B 6
B 20	1	0	1	1	0	0	0	0
B 21	1	0	1	0	0	1	1	1
B 22	1	0	0	1	0	0	1	1
C 20	1	0	0	1	1	1	0	0
C 21	1	0	1	0	0	1	1	0
C 22	1	0	0	1	1	1	0	1
D 20	1	0	0	0	1	0	0	0
D 21	1	0	0	1	0	0	1	0
D 22	1	0	0	0	1	0	0	1

3.7 BATTERY TEST

Proceed as follows :

- prepare a message,
- disconnect the mains,
- reconnect the mains cord,
- repeat the previously prepared message,
- compare the results which should be identical, if not, the battery is faulty.

3.8 UTILISATION OF THE SELF-TEST

- put the 0/1 switch * on to 0,
- with the machine power on, does the "ON" light come on ?
  . IF NOT : check the fuse and if the fault persists, refer to POWER SUPPLY.
- start the self-test by pressing the reset to zero button *,
- does the PRINTER DEVICE return to the left stop ?
  . IF NOT : put the ON/OFF switch onto OFF and check the pressure required on the thumbwheel needed to wind on the paper. Repeat the operation with the switch on "ON". If the POWER SUPPLY is operational, tightness should be felt when turning the thumbwheel.
    . IF NOT : change the POWER SUPPLY, does the fault persist ?
      . IF YES : change the MASTER board and check the wiring.
- do all the lights of the OPERATING KEYBOARD come on for 1 second ?
  . IF NOT : are they all off,
    . IF YES : see PREPARATION MODULE,
    . IF NOT : change the lights or the KEYBOQRD INTERFACE board.

* Located to the rear of the machine

- does the DISPLAY SCREEN display the DISPLAY SELF-TEST FINISHED?

  . IF NOT : does the alarm sound?

    . IF YES : see PREPARATION MODULE
    . IF NOT : change the DISPLAY INTERFACE board then the DISPLAY CONTROL board.

- does the alarm sound, do the ADAPTATION* board lights come on and the SCREEN flash?

  . IF YES : see LINE MODULE.

- is the printed information correct?

  . IF NOT : see PRINTER MODULE.

- see NETWORK CONNECTION

* On certain types of ADAPTATION boards.

3.9 PREPARATION MODULE

- do the lights in the first row* come on?
  - . IF YES : change the MEMORY board
  - . IF NOT : do the lights in the 2nd row come on?
    - . IF YES : change the MPU board
    - . IF NOT : do the 3rd row lights come on?
      - . IF YES : change the DISPLAY CONTROL board.
        Does the fault persist?
        - . IF YES : change the DISPLAY INTERFACE board.
      - . IF NOT : do the 4th row lights come on?
        - . IF YES : change the KEYBOARD + EXCHANGE INTERFACE board.

- has a MODULE been replaced?
  - . IF YES : repeat self-test.

* 1st row :
The upper OPERATING KEYBOARD row of the machine when sitting in the operator's seat.

3.10 LINE MODULE

- is there ONE pulse per pulse train ?
  - . IF YES : change the MPU board* of the LINE MODULE
  - . IF NOT : are there TWO pulses per train?
    - . IF YES : change the MEMORY board*
    - . IF NOT : are there THREE pulses per train?
      - . IF YES : change the second optional MEMORY board*
      - . IF NOT : are there FOUR pulses per train?
        - . IF YES : change the ANSWERBACK CODE* + ADAPTATION (PERSONALISATION) board
        - . IF NOT : are there FIVE pulses per train?
          - . IF YES : change the ACIA + EXCHANGE INTERFACE board
          - . IF NOT : are there SIX pulses per train?
            - . IF YES : change the ADAPTATION board
            - . IF NOT : change the MASTER board and check:
              - the OPERATING CONNECTING board
              - the TELEGRAPH POWER SUPPLY.

- had a MODULE been replaced?
  - . IF YES : repeat the self-test.

* Equipped with suitable memory circuits.

3.11 PRINTER MODULE

- are all of the PRINTER functions faulty?
  - . IF YES : change the MPU board, then the PRINTER INTERFACE if the fault persists.
  - . IF NOT : is there a writing fault?
    - . IF YES : change the PRINTER INTERFACE board, then the PRINTER DEVICE if the fault persists.
    - . IF NOT : is there a linefeed fault?
      - . IF YES : change the PRINTER INTERFACE board and then the LINEFEED MOTOR if the fault persists
      - . IF NOT : is there a CARRIAGE advance and return fault?
        - . IF YES : change the PRINTER INTERFACE board and if the fault persists, change:
          - . the POWER AMPLIFIER, then
          - . the FEED MOTOR, and after further test
          - . the SENSOR/CODER
        - . IF NOT : another fault?
          - . IF YES : check the wiring and if necessary, change the MASTER board.

- has a MODULE been replaced?
  - . IF YES : repeat the self-test.

3.12 POWER SUPPLY MODULE

- when turning on the power, does the fuse blow or the cut-off switch cut off?
  . IF YES : put the switch on "OFF" and
  disconnect the following electromechanical modules :
  . PRINTED DEVICE
  . LINEFEED MOTOR
  . ADVANCE MOTOR and POWER AMPLIFIER.

- put the switch back to "ON", does the cut-off switch cut off?
  . IF YES : put to the switch onto "OFF",
  remove a board,
  put the switch to "ON".

- does the cut-off switch cut off?
  . IF YES : put the switch of "OFF",
  replace the previous board,
  remove the next board,
  put the switch on "ON", etc. and so on until the faulty board is found.

  BEFORE REPLACING THE NEW BOARD, TEST THE ELECTROMECHANICAL MODULE CONTROLLED BY THIS BOARD WITH AN OHMMETER.

- change the fault MODULE
  . IF NOT : reconnect the modules one by one, change the module causing cut-out.

3.13 CONNECTION TO NETWORK

After carrying out the self-test, connect to network (the ANSWERBACK CODE memory must be programmed).

END OF SELF-TEST.

4 REMOVAL AND INSTALLATION OF MODULES

When removal of a module requires one of the operations already described above, we simply mention the title of the paragraph describing the operation.

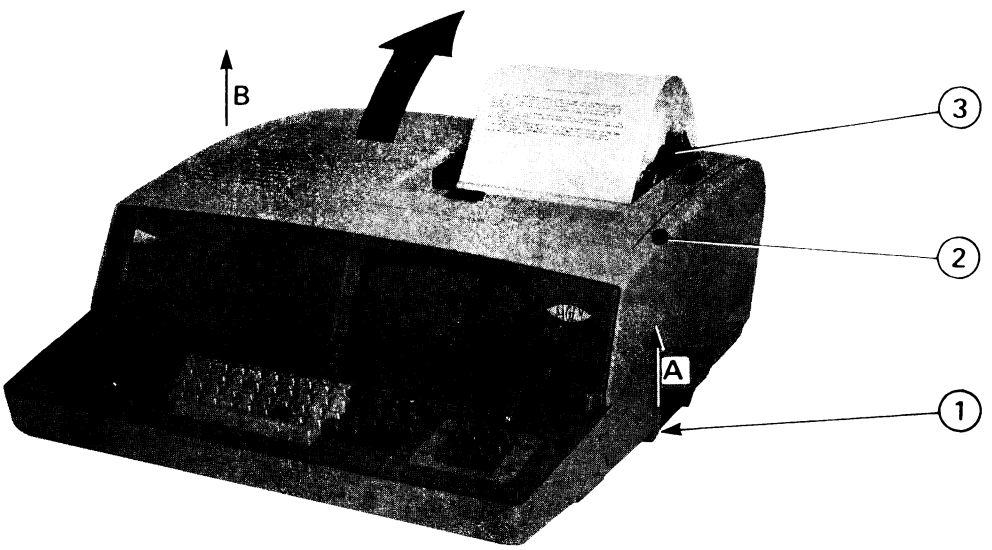
IMPORTANT : - never loosen the painted screws.

- disconnect the mains cord before working on the machine.

4.1 LIST OF TOOLING

- M3 hexagonal socket head screwdriver
- flat screwdriver, 5mm diameter
- 5.5mm pipe spanner
- blunt-ended 0.5mm feeler gauge
- tooling block No. 23 106 769-3.

4.2 MAINTENANCE COVER



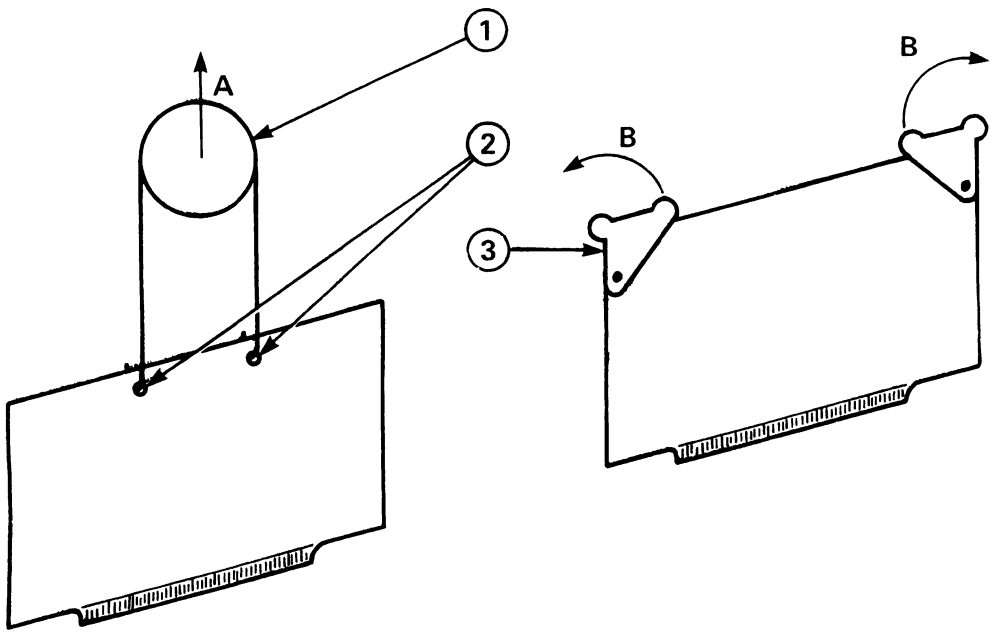
Removal

- lift up the OPERATOR'S COVER (2) ,
- disconnect the PAPER DEFLECTOR grounding cord,
- push the PAPER FEED (3) towards the front of the machine,
- push the two bolts (1) in the direction of arrow A,
- remove the MAINTENANCE COVER in the direction of arrow B.

Réinstallation

- proceed in removal reverse order,
- do not forget to reconnect the PAPER DEFLECTOR ground cord.

4.3 ELECTRONIC BOARDS



Removal

- remove the MAINTENANCE COVER,
- disconnect the upper connectors if necessary,

  IMPORTANT : DO NOT PULL ON THE WIRES.

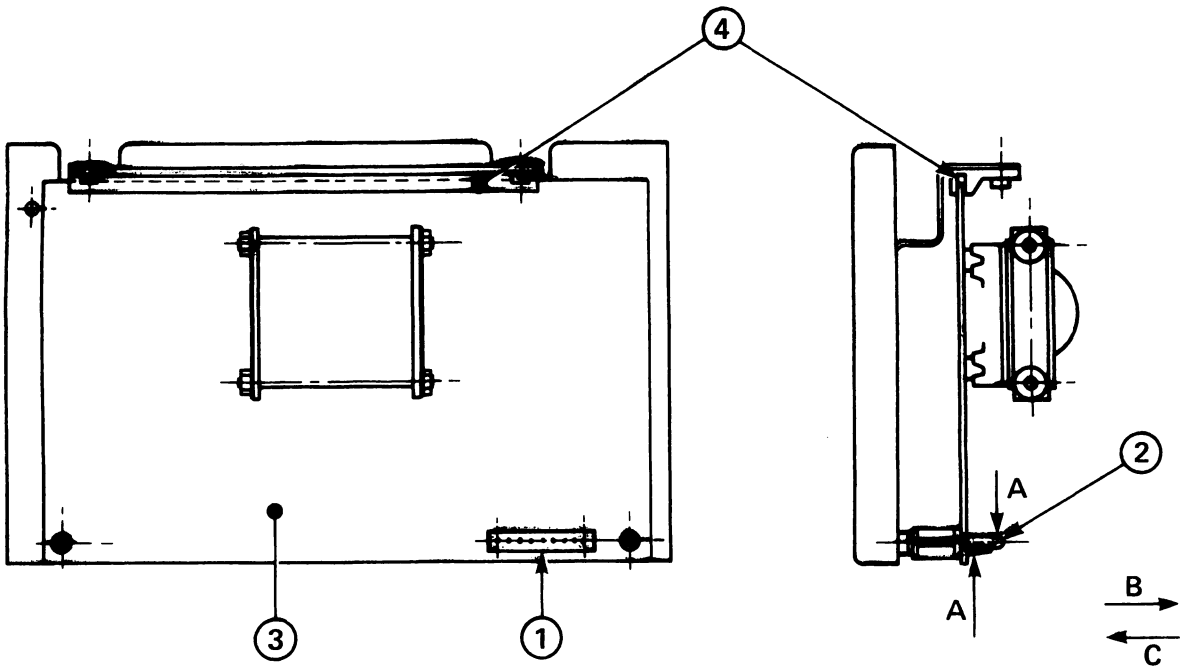
- either use the extractor for board (1) located under the COVER, in holes (2) ; and then pull in direction of arrow A,
- or pivot the extractors (3) in the direction of arrow B.

Reinstallation

- check that the position of the different jumpers and selector switches corresponds to the machine operating mode,
- reconnect the upper connectors if necessary.

NOTE : DO NOT FORGET to remove the memory circuits fitted on the support and to position them in the same place on the new board. This is particularly important for the MPU, PRINTER MPU, ANSWERBACK CODE + ADAPTATION CONTROL(PERSONALISATION) and DISPLAY INTERFACE boards.

4.4 TELEGRAPH POWER SUPPLY



Removal

- remove the MAINTENANCE COVER,
- remove the PRINTER INTERFACE board,
- remove the PRINTER MPU board,
- disconnect connector (1) ,
- pinch together attachment points (2) in direction of arrows A,
- gently lift out the board (3) as per arrow B,
- remove the TELEGRAPH POWER SUPPLY board.

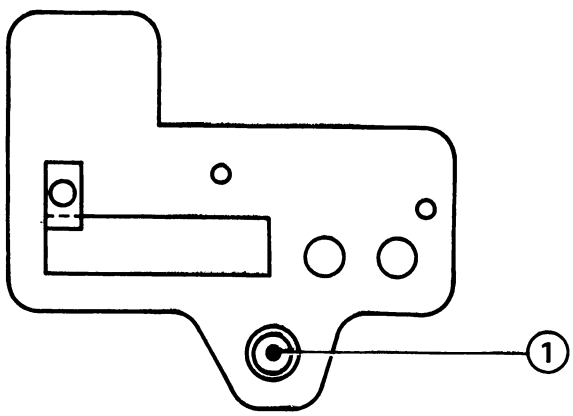
Reinstallation

- insert the board (3) into the board guide (4) ,
- push on board (3) as per arrow C,
- connect the connector (1) ,
- fit the PRINTER INTERFACE, PRINTER MPU boards,

DO NOT FORGET TO RECONNECT THE PRINTER CONNECTORS.

- fit the MAINTENANCE COVER.

4.5 OPERATING CONNECTION



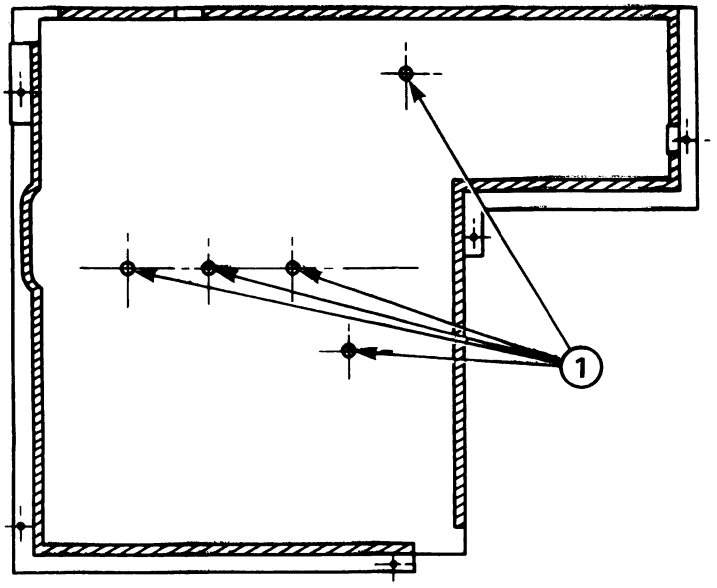
Removal

- unscrew the knurled wheel (1) ,
- remove the OPERATING CONNECTION by pulling toward the outside of the machine,
- disconnect the line cord, if necessary.

Reinstallation

- proceed in removal reverse order.

4.6 MASTER BOARD



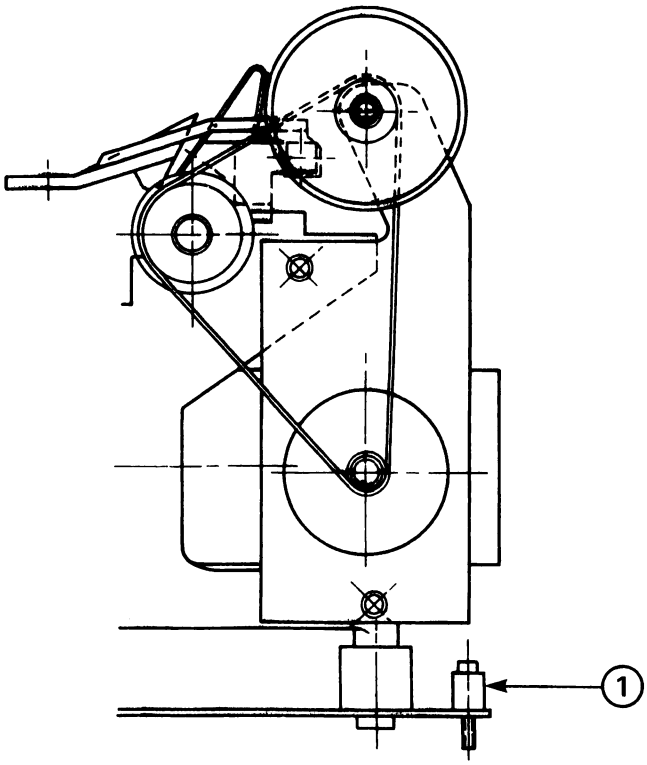
Removal

- remove the electronic boards,
- disconnect the connectors located on the MASTER board,
- stand the machine vertically on its rear side,
- remove the five screws (1) from the MASTER board support located underneath the machine,
- remove the MASTER board support,
- remove the MASTER board.

Reinstallation

- proceed in removal reverse order.

4.7 PRINTER



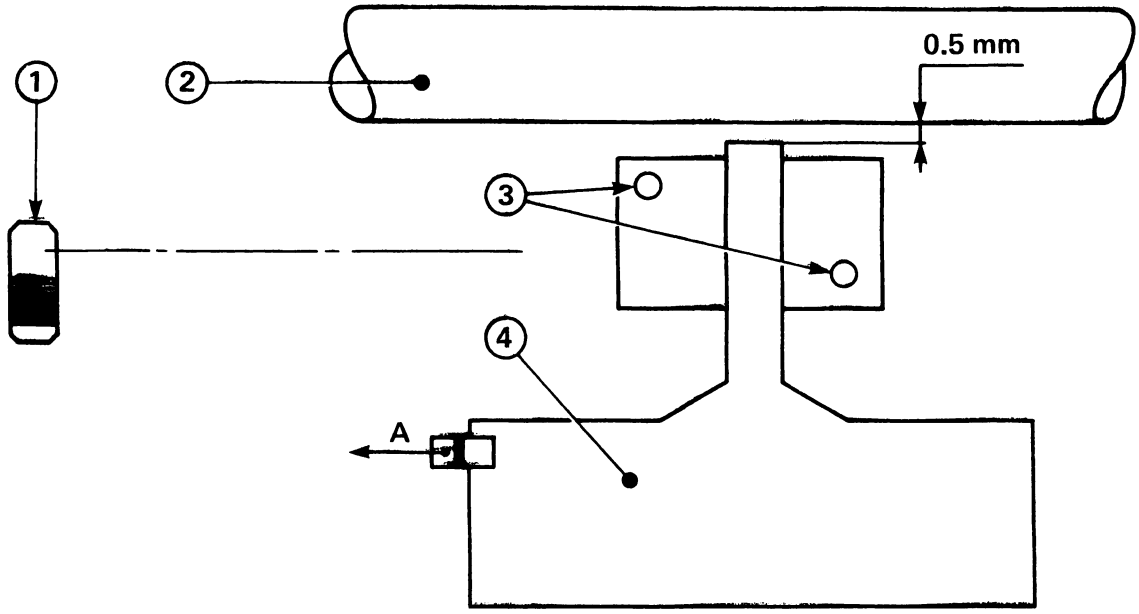
Removal

- remove the MAINTENANCE COVER,
- disconnect the PRINTER INTERFACE board upper connectors,
- disconnect the TELEGRAPH POWER SUPPLY connector,
- loosen screws (1) ,
- lightly push back the CHASSIS,
- disengage the CARRIAGE CABLE from its clip located on the DISPLAY SCREEN,
- remove the PRINTER.

Reinstallation

- proceed in removal reverse order.

4.8 PRINTER DEVICE



Removal

- remove the MAINTENANCE COVER,
- remove the RIBBON CARTRIDGE,
- disconnect the PRINTER DEVICE (4) along arrow A,
- remove the PRINTER DEVICE protective cover by opening out one of its mounting lugs.

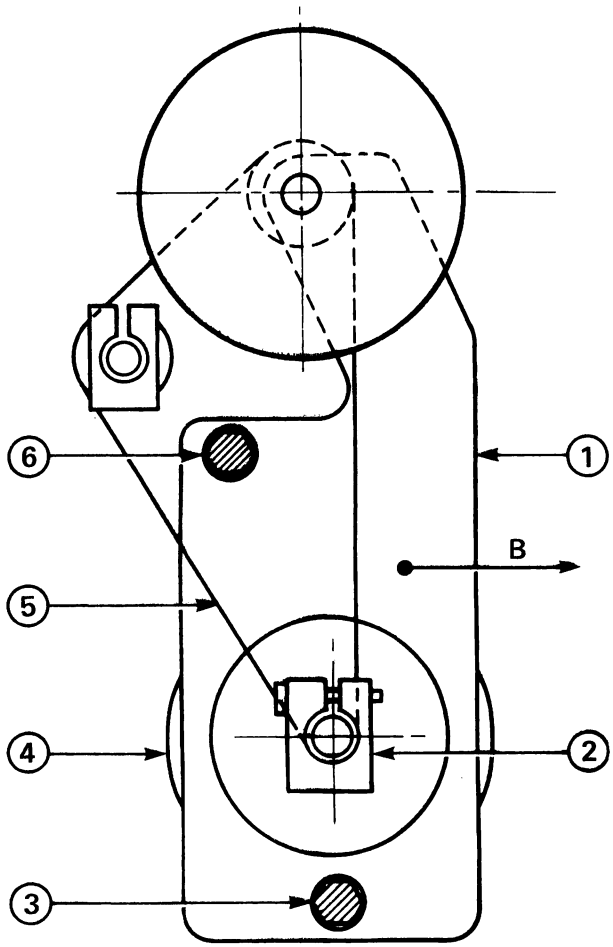
IMPORTANT : NEVER UNSCREW THE PAINTED SCREWS.

- remove the 2 mounting screws (3) ,
- remove the PRINTER DEVICE and the RIBBON GUIDE PIN.

Reinstallation

- proceed in reverse removal order but before tightening home the 2 PRINTER DEVICE mounting screws (3) , perform the following adjustment:
  . position the adjuster lever (1) in the smallest gap position.
- use a thickness gauge to set the distance between the end of the PRINTER DEVICE and the PRINT ROLLER (2) (adjustment performed without paper and without ribbon) to 0.5 mm.

4.9 LINEFEED MOTOR



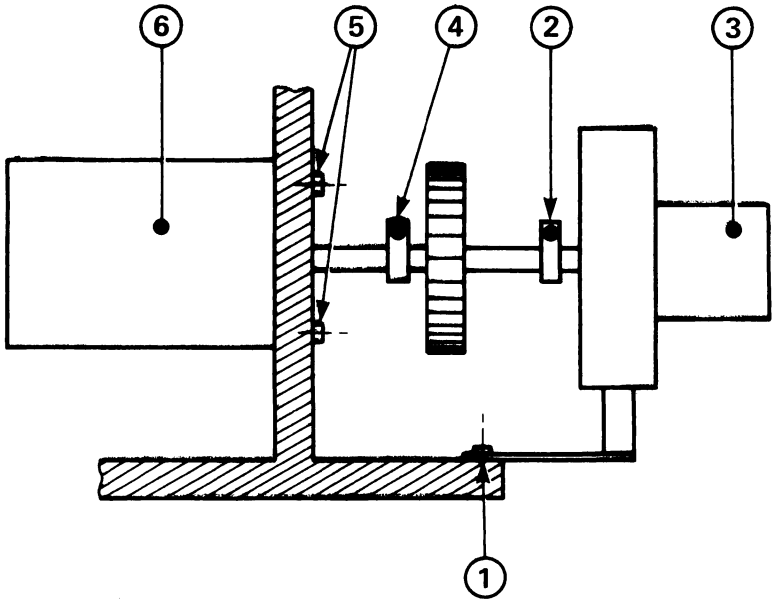
Removal

- remove the PRINTER,
- remove the two screws (3) and (6) for the LINEFEED MOTOR (1) support mounting,
- disengage the notched belt (5) ,
- remove the LINEFEED MOTOR-support assembly.

Reinstallation

- proceed in removal reverse order and in order to set the drive belt tension :
  - . fit screws (3) and (6) but do not tighten home,
  - . check that belt (5) is properly engaged,
  - . the correct tension for belt (5) is supplied by the LINEFEED MOTOR (4) weight,
  - . tighten screws (3) and (6) .

4.10 SENSOR/CODER



Removal

- disconnect the SENSOR/CODER from the PRINTER INTERFACE,
- remove the SENSOR/CODER attachment screw (1) ,
- disconnect the distortion hub screw (2) ,

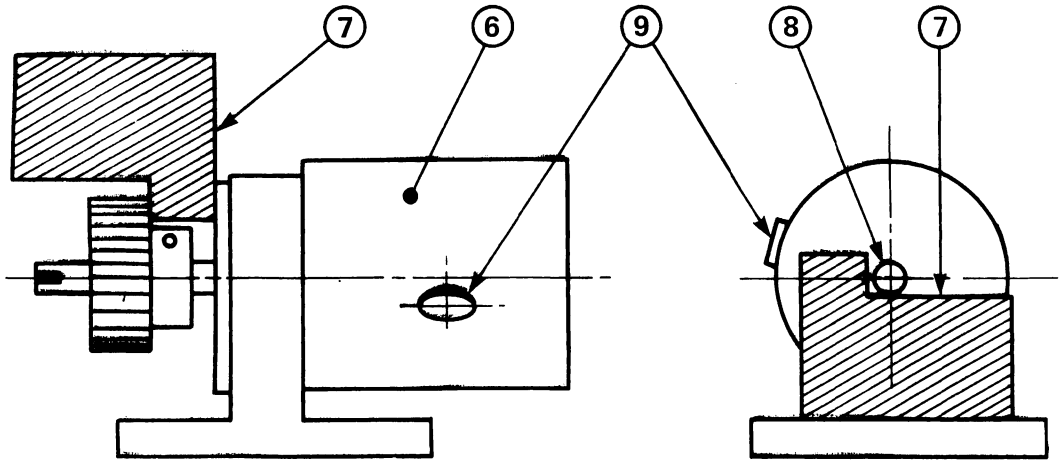
IMPORTANT : NEVER UNSCREW THE PAINTED SCREWS

- remove the SENSOR/CODER (3) .

Reinstallation

- proceed in removal reverse order.

4.11 DRIVE MOTOR



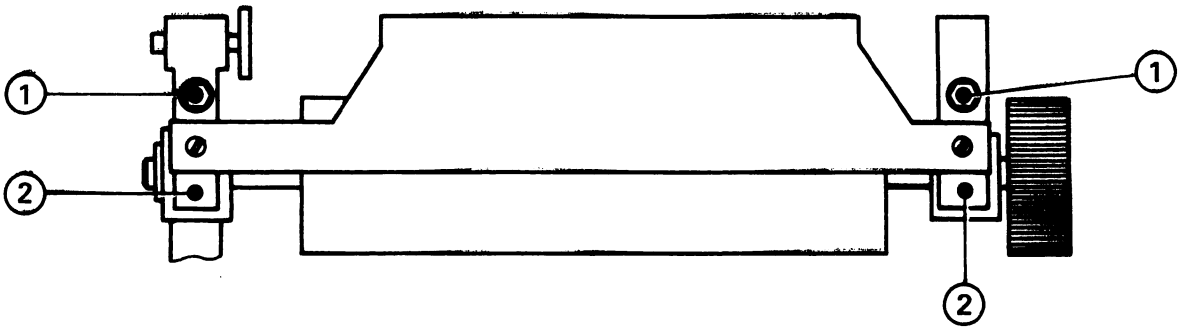
Removal

- remove the PRINTER,
- remove the SENSOR/CODER (3) ,
- remove the notched belt,
- remove the distortion hub (4) and the drive pulley,
- remove the 3 DRIVE MOTOR attachment screws (5) ,
- remove the DRIVE MOTOR (6) .

Reinstallation

- proceed in removal reverse order,
- position the flange and the DRIVE MOTOR assembly without blocking the three screws (5) . The position of the brushes MUST be respected (9) ,
- adjust the position of the motor shaft (8) for height using the setting tool (7) ,
- tighten the three DRIVE MOTOR (6) attachment screws (5) ,
- install the pulley and adjust its position with the setting tool (7) ,
- fit the SENSOR/CODER (3) ,
- tighten the two distorsion hub screws (2) and (4) .

4.12 PRINT ROLLER



Removal

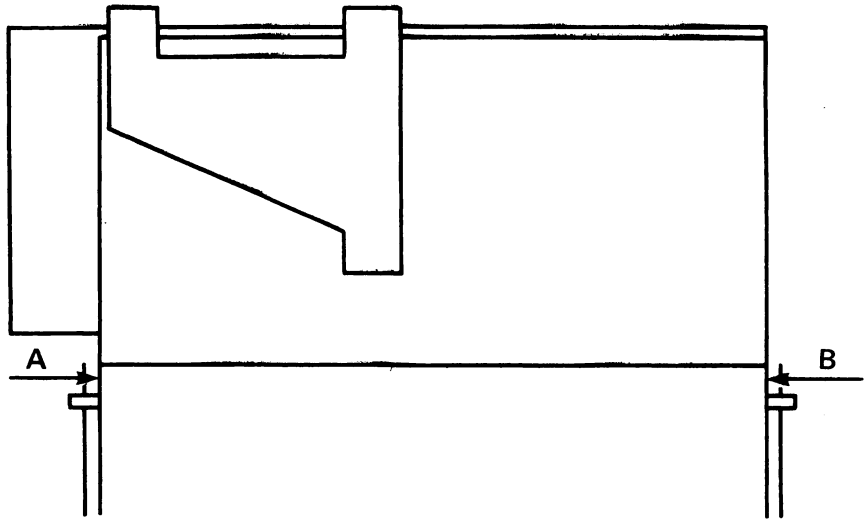
- lift up the OPERATOR'S COVER,
- remove the two screws (1) attaching the PRINT ROLLER flanges (2) ,
- disengage the belt,
- remove the flanges and the PRINT ROLLER.

The PRINT ROLLER is fitted with the pulley and its bearings.

Reinstallation

- proceed in removal reverse order.

4.13 PAGE PAPER FEED



Removal

- lift up the MAINTENANCE COVER,
- remove the PAPER ROLLER,
- remove the end of paper connector,
- disengage the module by pushing first along arrow A and then along arrow B,
- remove the PAGE PAPER FEED.

Reinstallation

- proceed in removal reverse order.

4.14 KEYBOARD

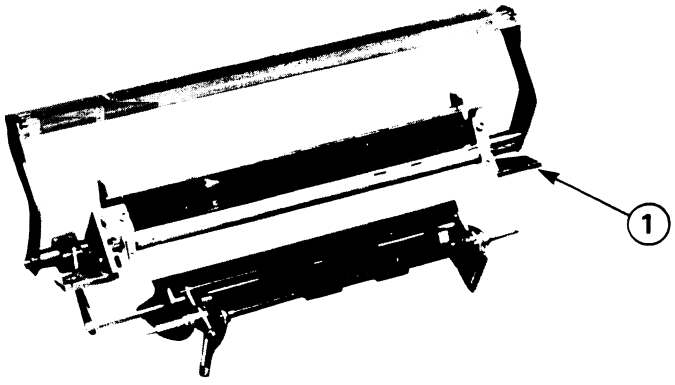
Removal

- remove the MAINTENANCE COVER,
- remove the front and the guard from around the KEYBOARD,
- disconnect the connectors,
- remove the KEYBOARD.

Reinstallation

- proceed in removal reverse order.

4.15 PRESSURE ROLLERS



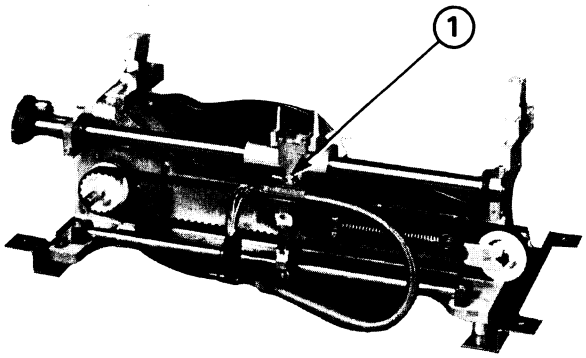
Removal

- remove the MAINTENANCE COVER,
- remove the PAGE PAPER FEED,
- disengage the PRINT ROLLER ROLLERS with the lever,
- remove the two screws (1) ,
- remove the PRESSURE ROLLERS.

Reinstallation

- bring the module into abutment against the CHASSIS and proceed in reverse removal order.

4.16 CARRIAGE CABLE



Removal

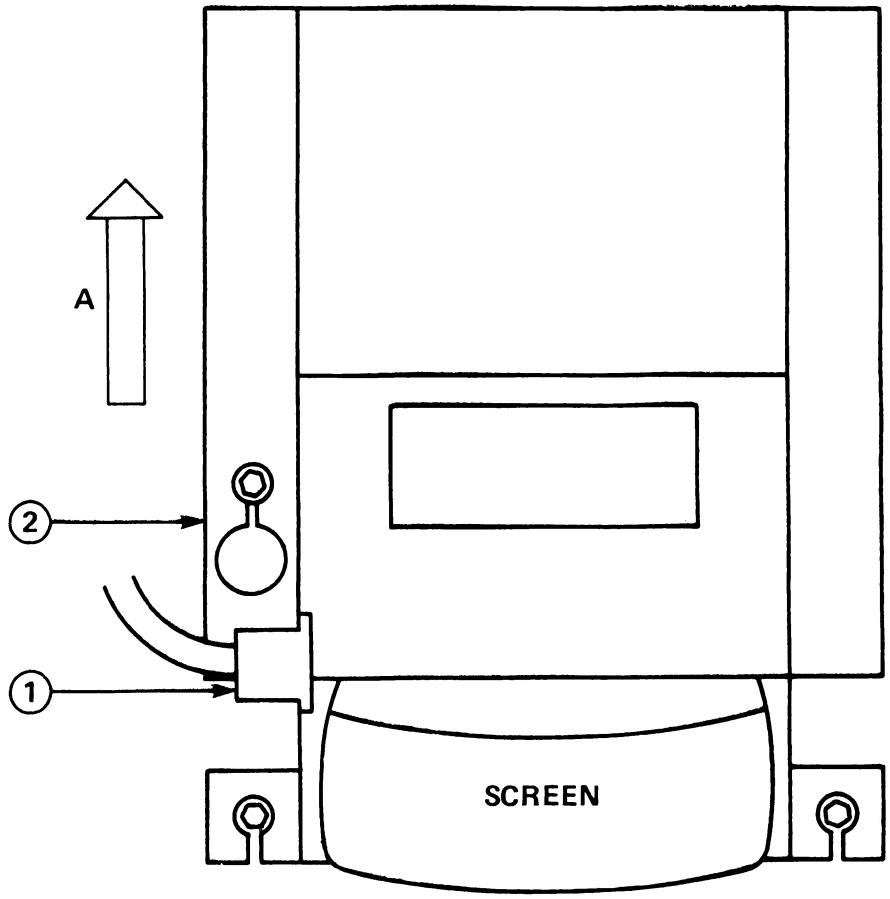
- remove the PRINTER,
- remove the PRINTER DEVICE,
- remove nut (1) which fixes the cable attachment flange,
- remove the CARRIAGE CABLE.

Reinstallation

- proceed in removal reverse order.

IMPORTANT : DO NOT DISTORT THE SPRING SHEATH, THE TOP SHOULD REMAIN FREE INSIDE THE SHEATH.

4.17 DISPLAY SCREEN



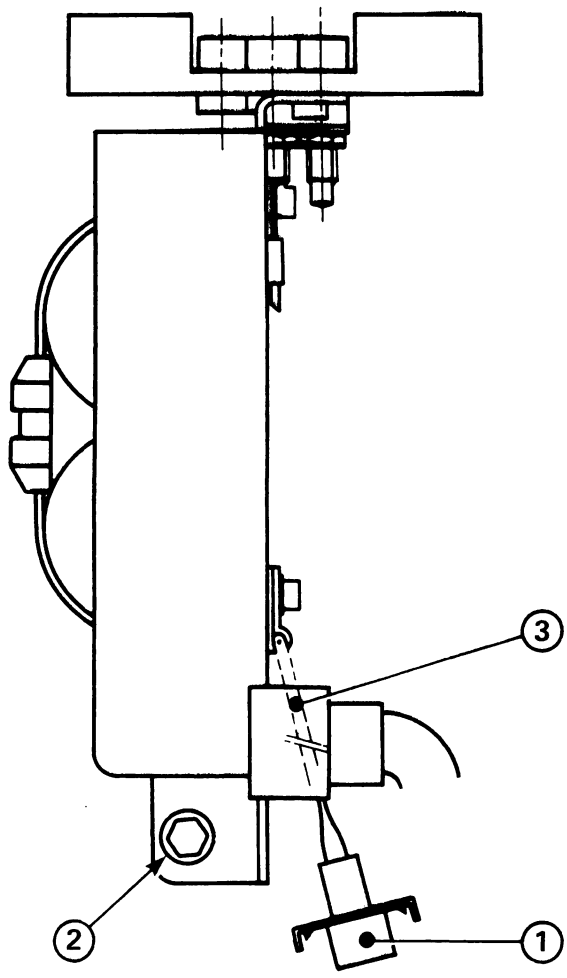
Removal

- remove the TOP COVER,
- disconnect the connector (1) ,
- loosen screw (2) ,
- disengage the assembly along arrow A,
- remove the DISPLAY SCREEN.

Reinstallation

- proceed in removal reverse order.

4.18 POWER AMPLIFIER



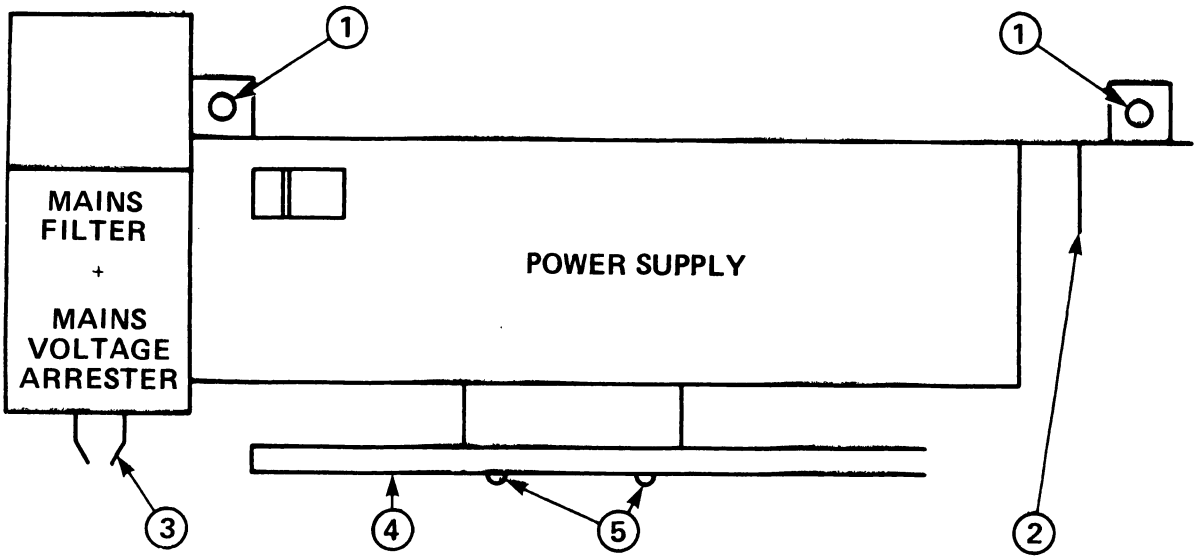
Removal

- remove the MAINTENANCE COVER,
- disconnect connectors (1) and (3) ,
- remove screw (2) ,
- remove the POWER AMPLIFIER.

Reinstallation

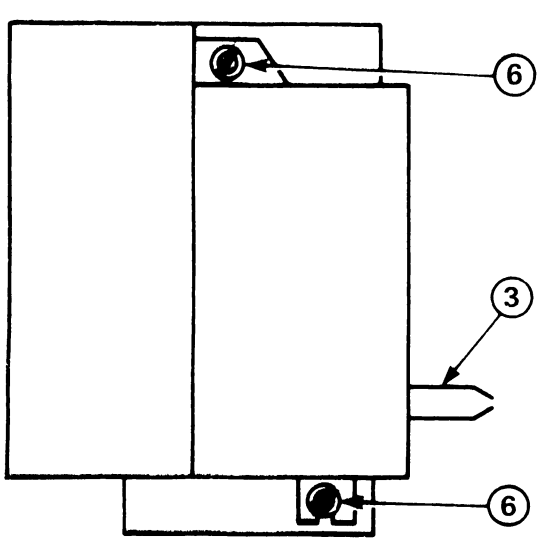
- proceed in removal reverse order.

4.19 POWER SUPPLY AND MAINS FILTER



Removal

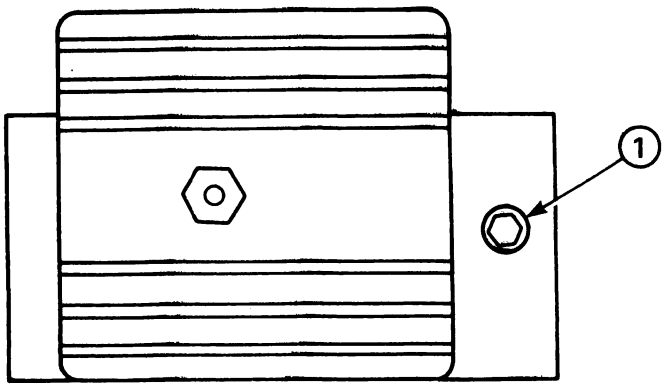
- remove the MAINTENANCE COVER,
- disconnect connectors (2) ,
- disconnect the MAINS CORD (3) ,
- remove the HEATSINK (4) attached by the 4 screws (5) ,
- remove screws (1) ,
- remove the POWER SUPPLY and MAINS FILTER unit,
- remove screws (6) ,
- remove the MAINS FILTER.



Reinstallation

- proceed in removal reverse order.

4.20 BATTERY



Removal

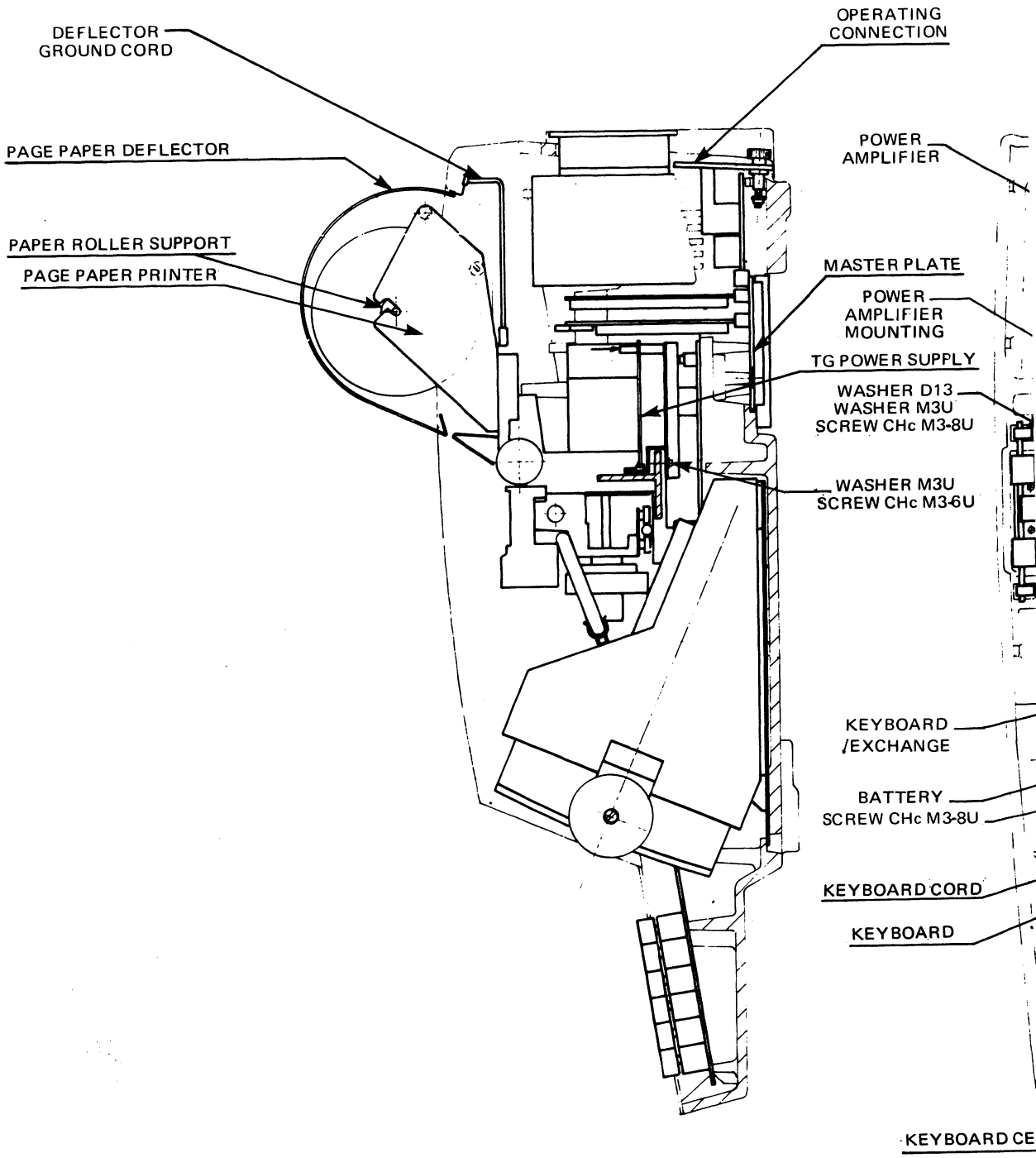
- remove the TOP COVER,
- remove screw (1) ,
- disconnect connector,
- disengage the module to the right,
- remove the BATTERY.

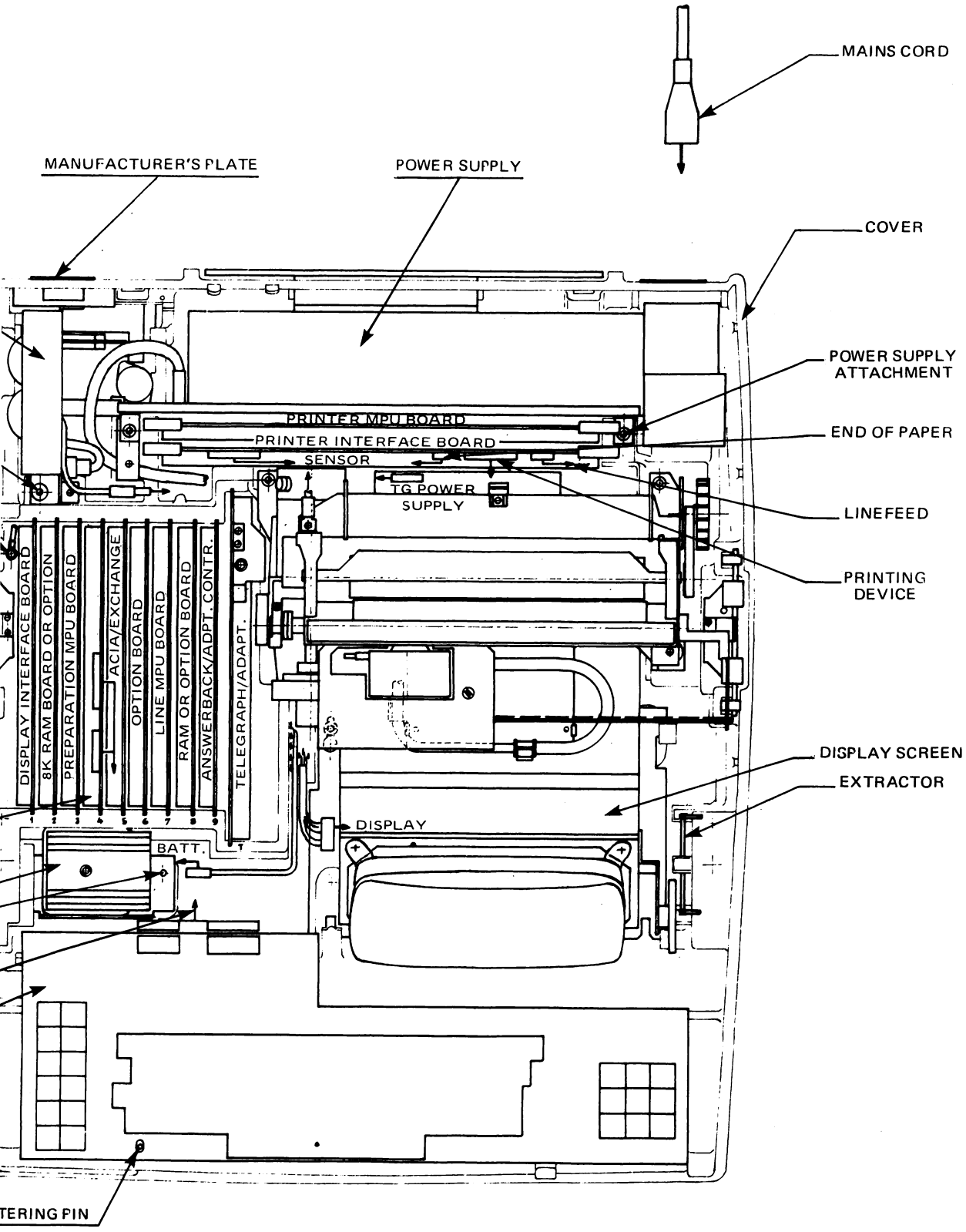
Reinstallation

- proceed in removal reverse order.

PLATE 1

LAYOUT
N° 23 110 760 - 8


DEFLECTOR GROUND CORD
OPERATING CONNECTION
PAGE PAPER DEFLECTOR
POWER AMPLIFIER
PAPER ROLLER SUPPORT
PAGE PAPER PRINTER
MASTER PLATE
POWER AMPLIFIER MOUNTING
TG POWER SUPPLY
WASHER D13
WASHER M3U
SCREW CHc M3-8U
WASHER M3U
SCREW CHc M3-6U
KEYBOARD /EXCHANGE
BATTERY
SCREW CHc M3-8U
KEYBOARD CORD
KEYBOARD
KEYBOARD CE


MAINS CORD
MANUFACTURER'S PLATE
POWER SUPPLY
COVER
POWER SUPPLY ATTACHMENT
PRINTER MPU BOARD
PRINTER INTERFACE BOARD
SENSOR
END OF PAPER
TG POWER SUPPLY
LINEFEED
PRINTING DEVICE
DISPLAY INTERFACE BOARD
8K RAM BOARD OR OPTION
PREPARATION MPU BOARD
ACIA/EXCHANGE
OPTION BOARD
LINE MPU BOARD
RAM OR OPTION BOARD
ANSWERBACK/ADPT. CONTR.
TELEGRAPH/ADAPT.
DISPLAY SCREEN
EXTRACTOR
DISPLAY
BATT.
TERING PIN

3

NOMENCLATURE ILLUSTREE

ILLUSTRATED CATALOGUE

NOMENCLATURA ILUSTRADA

ILLUSTRIERTES TEILEVERZEICHNIS

AVANT-PROPOS

1 - COMPOSITION DU DOCUMENT

Le présent document comprend :

- une planche 00 (zéro) accompagnée de son texte ; cette planche présente les différents ensembles susceptibles d'être déposés sur le site,
- un répertoire des fabricants.

2 - REPERAGE DE LA PLANCHE 00

Sur la planche 00, chaque composant principal est identifié par un «repère».

Lorsqu'un composant principal possède plusieurs variantes, il est identifié sur la planche 00 par un même repère numérique, suivi d'un indice alphabétique propre à chaque variante.

Dans le texte, certains articles ont leur numéro de repère précédé d'un tiret ; dans ce cas, l'article n'est pas localisé sur la planche.

3 - UTILISATION DU PRESENT DOCUMENT

Connaissant un article par sa position sur le matériel, rechercher le repère du composant principal correspondant en consultant la planche 00.

Se reporter au «REPERTOIRE DES FABRICANTS» qui donne en fonction du code fabricant (colonne 1), le nom et l'adresse du fabricant (colonne 2).

NOTA : Les composants électriques et électroniques possédant un repère circuit, sont identifiés par celui-ci sur la planche et dans le texte (2ème ligne de la colonne 3).

4 - REPRESENTATION DES LIENS D'APPARTENANCE ENTRE ARTICLE ET ENSEMBLE

La notion d'appartenance d'un article à un ensemble apparaît dans le texte selon le principe suivant :

- un article fait partie de l'ensemble immédiatement «supérieur» dont la description est décalée d'un rang vers la gauche,
- un ensemble comprend tous les articles ou ensembles immédiatement «inférieurs» dont la description est décalée d'un rang vers la droite.

Les articles de fixation ne sont pas illustrés et n'ont pas de repère particulier. Ils apparaissent dans le texte immédiatement en dessous de l'article qu'ils fixent, et sur le même rang que celui-ci.

5 - SIGNES ET ABREVIATIONS

- SB («SUIVANT BESOIN»)

Utilisé lorsque l'article ne peut être défini qu'au moment du réglage de l'appareil.

- ******

Ce signe utilisé en colonne 2 de la nomenclature illustrée indique que l'article n'est pas prévu en rechange.

6 - COMMANDE DE PIECES DE RECHANGE

Pour commander une pièce de rechange, il est nécessaire d'indiquer :

- le nom de l'appareil, sa référence et son numéro de série (sur la plaque constructeur),
- la désignation de la pièce selon la nomenclature,
  Ex. : RESSORT
- le numéro de code suivi de sa clé,
  Ex. : 23008560-6

Les commandes de pièces de rechange et la corrrespondance s'y rapportant (demandes de prix, délais de livraison, facturation, etc.) sont à formuler à :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

Dans les cas d'urgence, les demandes de rechange peuvent être formulées par téléphone ou de préférence par message télex à l'adresse ci-dessus.

FOREWORD

1 - DOCUMENT COMPOSITION

The present document includes :

- a plate 00 (zéro) with its text ; this Plate shows the various assemblies likely to be removed in situ,
- an Index of Manufacturers.

2 - PLATE 00 IDENTIFICATION

On Plate 00, each main component is identified by an «item number».

When a main component has several variants, it is identified on Plate 00 with a same item number followed by an alphabetical index proper to each variant.

In the text, some items have their item number preceded by a dash ; in that case, the item is not located on the Plate.

3 - HOW TO USE THE PRESENT DOCUMENT

Knowing an item by its position on equipment, seek out the item No of the main corresponding component, by consulting the Plate 00.

Refer to the «INDEX OF MANUFACTURERS» which gives, according to the Manufacturer's code (column 1), the name and address of Manufacturer (column 2).

NOTE : Electric and electronic components having a circuit reference code, are identified by this code in Plate and text (2nd line of column 3).

4 - REPRESENTATION OF RELATIONSHIP BETWEEN ITEM AND ASSEMBLY

The notion of an item belonging to an assembly appears in the text according to the following principle :

- an item belongs to the assembly immediately «uper», whose description is shifted by one row to the left,
- an assembly includes all of the items or assemblies immediately «lower», whose description is shifted by one row to the right.

The attaching items are not illustrated and have no special item number. They appear in the text immediately belows the item they attach, and in the same row as this item.

5 - SIGNS AND ABBREVIATIONS

- SB («SUIVANT BESOIN»)

This indicates that the quantity required can only be determined when carrying out maintenance or adjustements.

- ******

This sign in column 2 of parts list means taht no spare is provided for this component.

- (R1) A (R4)

Mention in french whose translation is : (R1) TO (R4).

6 - ORDER FOR REPLACEMENT PARTS

When ordering a part, please indicate :

- machine name, its reference and serial number (on name plate),
- the part name,
  e.g. : «SPRING»

Orders and all related correspondance (enquiries, concerning bills, delivery dates, etc.) should be addressed to :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

Urgent orders may be telephoned or (preferably) telexed to the same address.

PROLOGO

1 - COMPOSICION DEL DOCUMENTO

El presente documento comprende :

- una lámina 00 (cero) acompañada de su texto ; esta lámina presenta los diferentes conjuntos que pueden sur desmontados «in situ»,
- un repertorio de los fabricantes.

2 - REFERENCIACIÓN DE LA LÁMINA 00

En la lámina 00 cada componente principal es identificado por una «referencia».

Cuando un componente principal posede diversas variantes, se identifica en la lámina 00 con la misma referencia numérica, seguida por un índice alfabetico propio de cada variante.

En tel texto, una barra precede el número de referencia de ciertos artículos ; en este caso, el artículo no se encuentra localizado en la lámina.

3 - USO DEL PRESENTE DOCUMENTO

Conociendo un artículo por su posición en el material, buscar la referencia del componente principal correspondiente consul tando la lámina 00.

Referirse al «REPERTORIO DE LOS FABRICANTES» que suministra, en función del código fabricante (columna 1), el nombre y la dirección del fabricante (columna 2).

NOTA : Los componentes eléctricos y electrónicos poseen una referencia circuito, gracias a la cual son identificados en la lámina y en el texto (2ª linea de la columna 3).

4 - REPRESENTACION DE LOS VINCULOS ENTRE ARTICULO Y CONJUNTO

La noción de vínculo entre un artículo y un conjunto aparece en el texto, de acuerdo con el principio siguiente :

- un artículo forma parte del conjunto inmediatamente «superior», cuya posición se encuentra corrida de una fila hacia la izquierda,
- un conjunto comprende todos los artículos o conjuntos inmediatamente «inferiores», cuya descripción se encuentra corrida de una fila hacia la derecha.

Los artículos de sujeción no son referenciadas y no llevan una referencia particular. Aparecen en el texto inmediatamente por debajo del artículo que sujetan y en la misma fila que éste.

5 - SIGNOS Y ABREVIACIONES

- SB («SEGUN NECESIDAD»)

Empleado cuando el artículo sólo puede ser definido en el momento del reglaje del aparato.

- ******

Este signo empleado en la columna 2 de la nomenclatura ilustrada, indica que el artículo no ha sido previsto en los recambios.

- R1 A R4

Mención en francés, cuya traducción es R1 A R4.

6 - PEDIDO DE PIEZAS DE RECAMBIO

Para pasar pedido por una pieza de recambio, es preciso indicar :

- el nombre del aparato, su referencia y su número de serie (que se leen en la placa del constructor),
- la designación de la pieza de acuerdo con la nomenclatura,
  Ejemplo : MUELLE
- el número de código, seguido de su clave,
  Ejemplo : 23008560-6

Los pedidos de piezas de recambio y la correspondencia referente a ellos (solicitudes de precios, plazos de entrega, facturación, etc.), deben sar dirigidos a :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone : 745-14-60 - Télex : 611890F - SAGEM PARIS

En los casos urgentes, las solicitudes de piezas de recombio pueden hacerse por teléfono ó preferentemente por mensaje telex a la dirección siguiente.

VORWORT

1 - ZUSAMMENSETZUNG DES DOKUMENTES

Das vorliegende Dokument umfasst :

- eine Zeichnung 00 (null) mit Text, die die Verschiedenen Baugruppen, die an der Baustelle ausgebaut werden können, darstellt,
- ein Verzeichnis der Hersteller.

2 - KENNZEICHNUNG DER ZEICHNUNG 00

Bei der Zeichnung 00 wird jedes Hauptbauelement durch ein «kennzeichen» identifiziert.

Wenn ein Hauptbauelement mehrere Varianten besitzt wird es auf der Zeichnung 00 durch ein gleiches numerisches Kennzeichen, dem ein jeder Variante eigenes alphabetisches Merkmal folgt, identifiziert.

Im text geht verschiedenen Artikeln ein Strich voran ; in diesem Falle ist der Artikel nicht in der Zeichnung angegeben.

3 - BENUTZUNG DES VORLIEGENDEN DOKUMENTES

Wenn ein Artikel durch seine Position auf dem Gerät bekannt ist, die Zeichnung 00 einsehen, um das Kennzeichen des entsprechenden Hauptbauelementes zu ermittein.

Siehe das «VERZEICHNIS DER HERSTELLER» welches in Bezug auf den Code des Herstellers (Spalt 1) den Namen und die Anschrift des Herstellers angibt (Spalt 2).

HINWEIS : Die elektrischen und elektronischen Bauelemente, die ein Schaltungskennzeichen besitzen, werden in der Zeichnung und im Text (2. Zeile des Spaltes 3) dadurch identifiziert.

4 - DARSTELLUNG DER ZUSAMMENHANGE ZWISCHEN ARTIKEL UND BAUGRUPPE

Der Begriff «Zusammenhang» zwischen Artikel und Baugruppe erscheint im Text noch dem nachstchenden Prinzip :

- ein Artikel gehört zum sofort «darüberliegenden» Baugruppe, dessen Beschreibung um eine Reihe nach links verschoben ist,
- ein baugruppe umfasst alle sofort «darunterliegenden» Artikeln oder Baugruppen, deren Beschreibung um eine Reihe nach rechts verschoben ist.

Die Befestigungsartikel sind nicht dargestellt und besitzen kein besonderes Kennzeichen. Im Text erscheinen sie direkt unter dem Artikel, den sie befestigen und in dergleichen Reihe wíe dieser.

5 - ZEICHEN UND ABKURZUNGEN

- SB («NACH BEDARF»)

Dieses Zeichen wird dann benützt, wenn der Artikel erst zum Zeitpunkt der Einstellung des Gerätes definiert werden kann.

- ******

Dieses im Spalt 2 der Stückliste mit Bildern benützte Zeichen bedented, dass der Artikel nicht als Ersatzteil vorgesehen ist.

- R1 A R4

Französischer Begriff der mit R1 bis R4 zu übersetzen ist.

6 - BESTELLUNG VON ERSATZTEILEN

Zur Restellung eines Ersatzteiles muss folgendes angegeben werden :

- der Name des Gerätes, die Referenz und die Seriennummer (auf dem Leistungsschild des Herstellers),
- die Bezeichnung des Teiles entsprechend der Stückliste,
  Beispiel : FEDER
- die Codenummer mit dem Schlüssel,
  Beispiel : 23008560-6

Die Bestellungen von Ersatzteilen und die damit verbundene Korrespondenz (Auskünfte über Preise und Liefertermine, Rechnungen, usw) sind zu richten an :

SAGEM
Département Téléimprimeurs
Service Pièces Détachées
6, avenue d'Iéna
75783 - PARIS-CEDEX 16
Téléphone 745-14-60 - Télex : 611890F - SAGEM PARIS

In dringenden Fällen können die Bestellungen von Ersatzteilen per Telefon oder verzugsweise per FS an nachstehende Adresse vorgenommen werden.

PLANCHE 00

PLATE 00

LAMINA 00

ZEICHNUNG 00

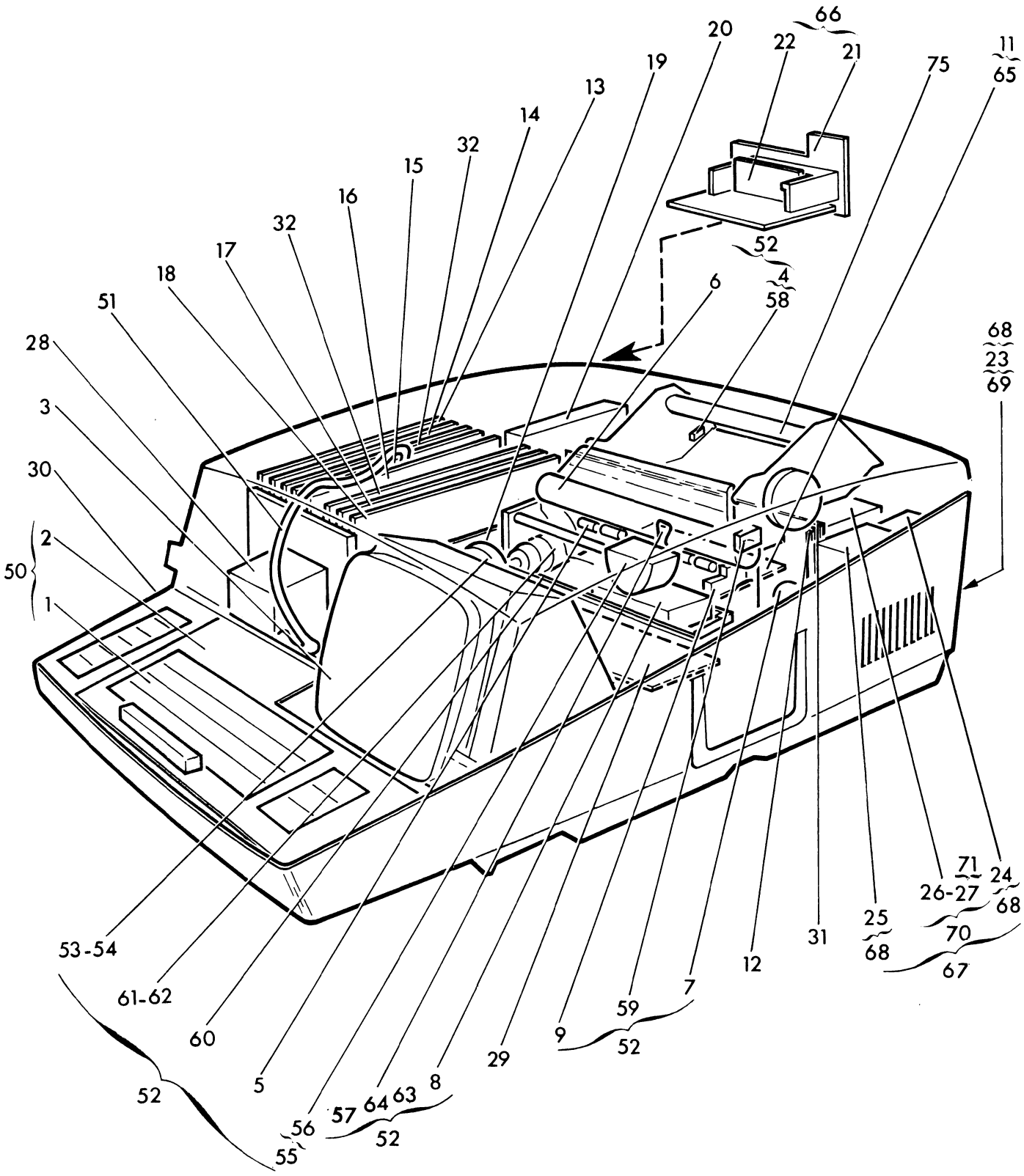


PLANCHE	00	TELEIMPRIMEUR	TX35
PLATE		*TELEPRINTER*	*TX35*
TABLA		TELEIMPRESOR	TX35
ABBILDUNG		*FERNSCHREIBER*	*TX35*

1	2	3 1 2 3 4 5 6 7	4		5
00	*********	TELEIMPRIMEUR TX35	*********	53840	
50A	23102326-6	. CLAVIER	23102326-6	53840	01
1	*********	. . TOUCHES	*********	53840	01
2A	*********	. . CARTE CLAVIER	*********	53840	01
50B	23104981-9	. CLAVIER	23104981-9	53840	01
1	*********	. . TOUCHES	*********	53840	01
2B	*********	. . CARTE CLAVIER	*********	53840	01
51	23104454-6	. CORDON CLAVIER	23104454-6	53840	01
3	23104449-2	. ECRAN DE VISUALISATION	23104449-2	53840	01
52	23104451-2	. IMPRIMANTE	23104451-2	53840	01
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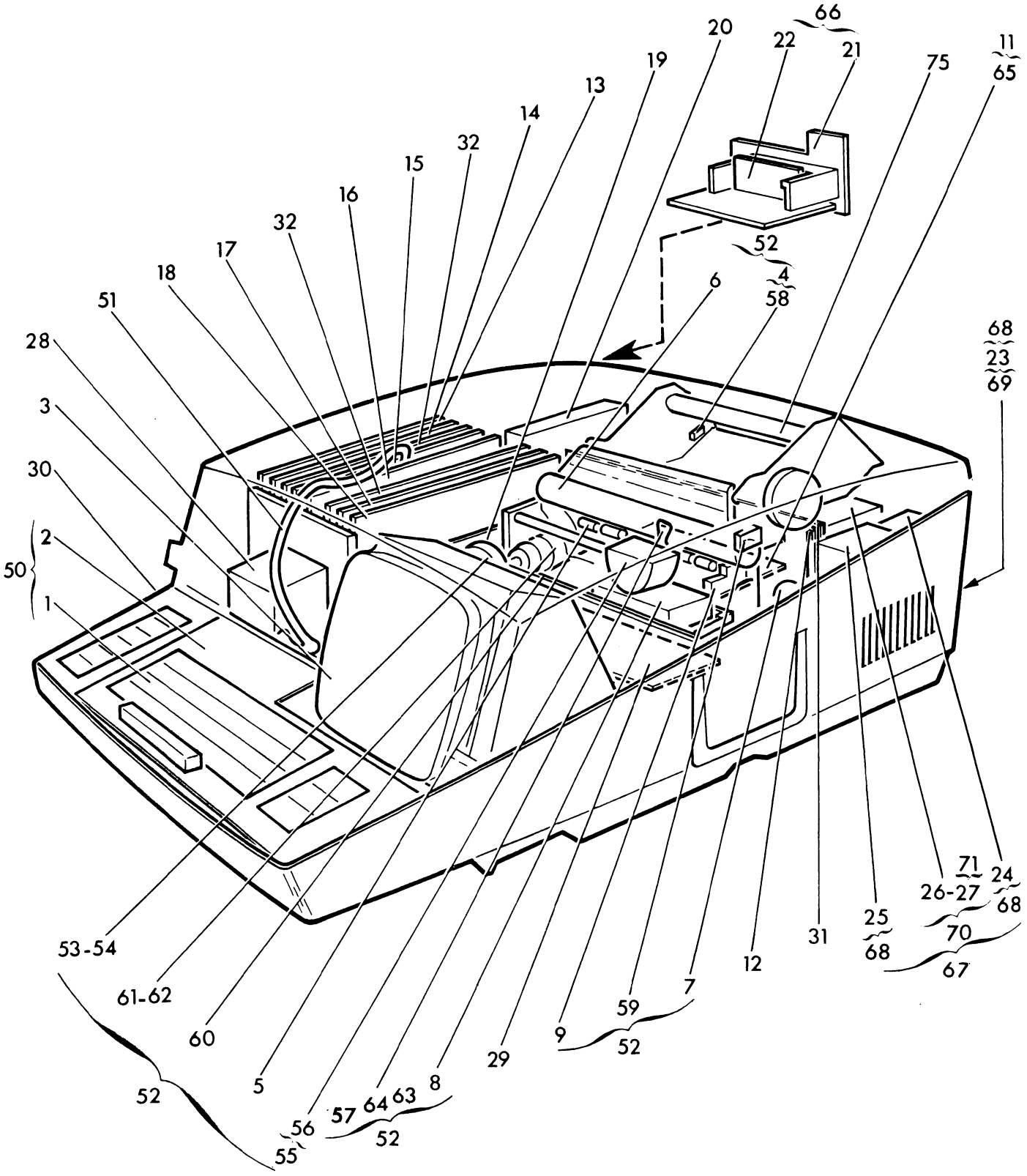

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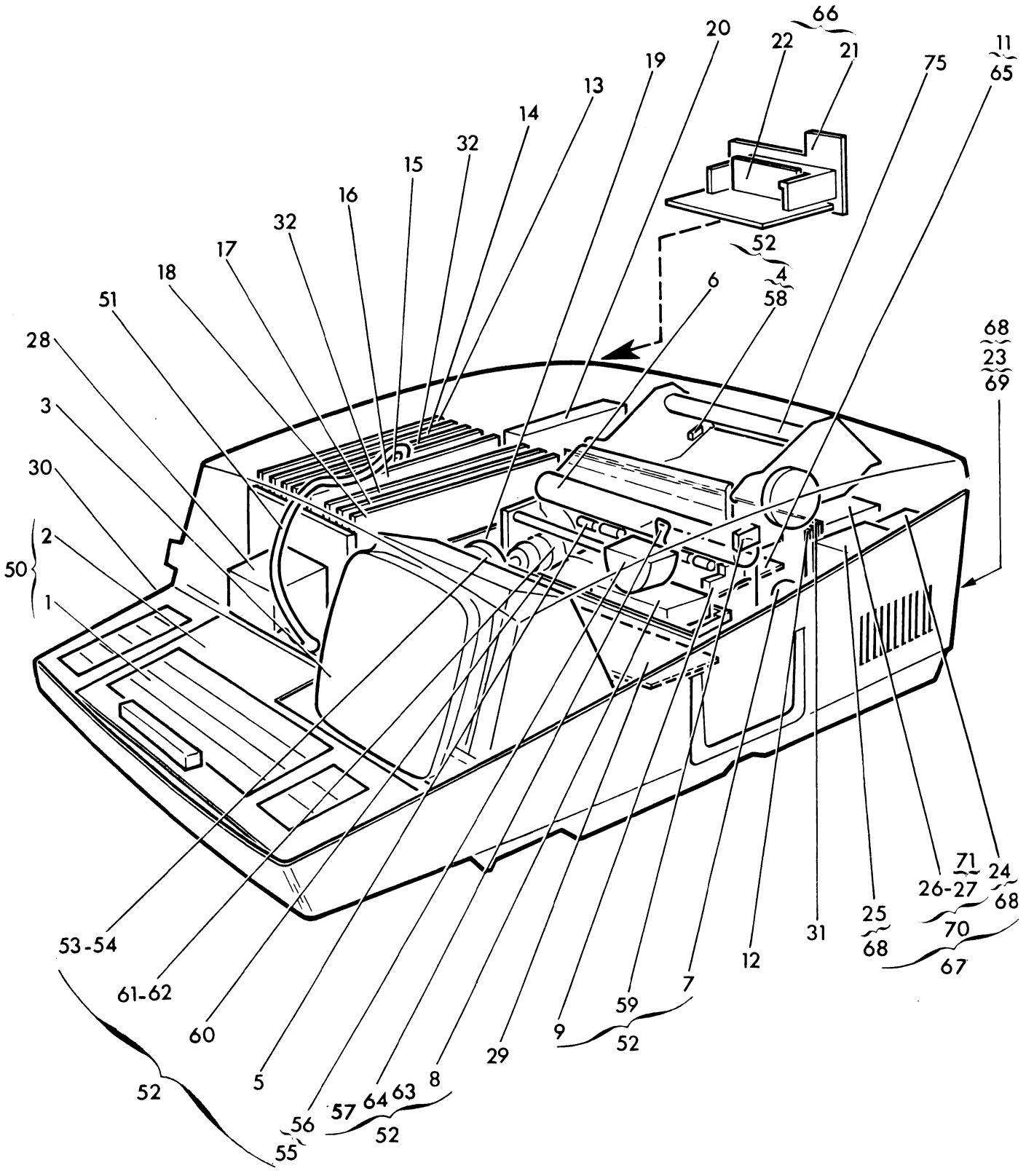

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7155	GOODYEAR TIRE AND RUBBER CO 1144 E MARKET AKRON OH 44316 USA
7538	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876 USA
10072	SILEC (STE INDUSTRIELLE DE LIAISONS ELECTRIQUES) SA 64 BD DE MONCEAU 75008 PARIS FRANCE
18767	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051 USA
50023	SAFT (STE DES ACCUMULATEURS FIXES ET DE TRACTION) DPT PILES SAFT LECLANCHE 156 AVENUE DE METZ 93230 ROMAINVILLLE FRANCE
50035	AFNOR (ASSOCIATION FRANCAISE DE NORMALISATION) TOUR EUROPE 92080 PARIS LA DEFENSE CEDEX 7 FRANCE
50075	AMP DE FRANCE DIV.AMPLIVERSAL 29 CHAUSSEE JULES CESAR 95301 PONTOISE FRANCE
50095	APEX (L'AMORTISSEUR) 4 RUE DUHESME 75018 PARIS FRANCE
50112	A.D.R LES APPLICATIONS DU ROULEMENT 1 AVENUE NEWTON 92140 CLAMART FRANCE
50116	APR (APPAREILLAGE PROFESSIONNEL RADIO ELECTRONIQUE) ANCIENS ETS JEAN ROGERO 82270 MONTPEZAT DE QUERCY FRANCE
50297	BNAE (BUREAU DE NORMALISATION DE L'AERONAUTIQUE ET DE L'ESPACE) 8 RUE MOREAU VAUTHIER 92100 BOULOGNE BILLANCOURT FRANCE
50337	COMATEL (COMPTOIR EUROPEEN DE MATERIEL ELECTRONIQUE) SA 26500 BOURG LES VALENCES FRANCE
50614	CROUZET SA 128 AVENUE DE LA REPUBLIQUE 75011 PARIS FRANCE
50711	DOMANGE (ETS) SA 198 AV.DES GRESILLONS 92206 ASNIERES FRANCE
50797	SFERNICE ELECTRO-RESISTANCE) 59 RUE GUTEMBERG 75737 PARIS CEDEX 15 FRANCE
50850	SEEM (STE D'ETUDES ELECTRO-MECANIQUES) SARL 15 AVENUE VICTOR HUGO 92170 VANVES FRANCE

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51148	HEWLETT-PACKARD CO CORPORATE HQ 1501 PAGE MILL RD PALO ALTO CA 94304 USA
51201	INA-ROULEMENTS SA ROUTE DE BITCHE 67501 HAGUENAU FRANCE
51241	JEANRENAUD (DEPARTEMENT ELECTROCOMMUTATION) B.P.359 39105 DOLE FRANCE
51254	LE JOINT FRANCAIS SARL 10 RUE DE LA BAUME 75008 PARIS FRANCE
51350	L.C.C-C.I.C.E (CIE EUROPEENNE DE COMPOSANTS ELECTRONIQUES) SA 36 AVENUE GALLIENI 93170 BAGNOLET FRANCE
51464	MANUFACTURE FRANCAISE D'OEILLETS METALLIQUES SA 5 RUE DE DUNKERQUE 75010 PARIS FRANCE
51530	MECANINDUS (STE) 54 RUE LOUIS BLANC 92400 COURBEVOIE FRANCE
51596	MICRO SA BOULEVARD DE BORD DE MER PRINCIPAUTE DE MONACO
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51918	PRONER (ETS) SA B.P. 31 93160 NOISY LE GRAND FRANCE
51950	RADIAL SA 101 RUE PHILIBERT HOFFMANN Z.I. 93110 ROSNY SOUS BOIS FRANCE
51956	R.T.C LA RADIOTECHNIQUE COMPELEC SA DIV RESISTANCES ET CONDENSATEURS 51 RUE CARNOT 92150 SURESNES FRANCE
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52367	TEXAS INSTRUMENTS - FRANCE SA 06270 VILLENEUVE LOUBET FRANCE
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52483	VIBRACHOC SA 216 BUREAUX DE LA COLLINE 92213 ST.CLOUD FRANCE
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52745	UTE (UNION TECHNIQUE DE L'ELECTRICITE) CCTU (COMITE DE NORMALISATION DU COMITE DE COORDINATION DES TELECOMMUNICATIONS) 12 PL DES ETATS UNIS 75783 PARIS CEDEX FRANCE
52746	ACCEL (ACCESSOIRES ELECTRONIQUES) SA 35 RUE DE LA MARE 75020 PARIS FRANCE
53072	EUROFARAD SA 92 RUE OBERKAMPF 75011 PARIS FRANCE
53127	HELLERMANN FRANCE SA 34 RUE GAETAN LAMY TOUSSUS LE NOBLE 75530 BUC FRANCE
53573	LOUPOT-CIE (ETS J.) SA ROUTE DE CONCARNEAU 29000 QUIMPER FRANCE
53735	SAVIGNY SA 938 AVENUE SAINT JUST 77530 VAUX LE PENIL FRANCE
54330	HARRIS MFG CO INC ST LOUIS MO USA
54515	CLARE INTERNATIONAL NV OVERHAAMLAAN 3700 TONGEREN BELGIQUE
54636	CELDUC (CONSTRUCTIONS ELECTRIQUES DU CENTRE) SA 42290 SORBIERS FRANCE
55242	COMEPA 34 RUE JACQUART 93500 PANTIN FRANCE
55326	GENERAL ELECTRIC SEMICONDUCTOR PRODUCT DEPARTEMENT ELECTRONICS PARK SYRACUSE NY 13221 USA
55626	INTEL FRANCE 74 RUE D'ARCUEIL 94528 RUNGIS CEDEX FRANCE
56184	METAFIX (STE) SA RUE EUGENE GAZEAU 60300 SENLIS FRANCE
56687	MOTOROLA INC SEMICONDUCTOR PRODUCTS DIV P O BOX 20923 5005 MCDOWELL RD PHOENIX AZ 85036 USA
56876	TEKELEC-AIRTRONIC B.P.2 92310 SEVRES FRANCE

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58852	MOSTEK FRANCE 30 RUE DU MORVAN SILIC 471 94613 RUNGIS CEDEX FRANCE
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59705	FAIRCHILD CAMERA AND INSTRUMENTS CORP SEMICONDUCTOR DIV 464 ELLIS ST MOUNTAIN VIEW CA 94042 USA
99992	SPECTROL ELECTRONICS CORP 17070 E GALE AVE CITY OF INDUSTRY CA 917745 USA
99993	ELEC-TROL 26477 NORTH GOLDEN VALLEY ROAD SANGUS CALIFORNIA 91350 USA
99994	LEGRAND (STE) SA 128 AV MARECHAL DE LATTRE DE TASSIGNY 87011 LIMOGES CEDEX FRANCE
99995	ITT CANNON ELECTRIC 666 E DYER RD SANTA ANA CA 92702 USA
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99999	SCHNORR,ADOLF,KG 7434 MAICHINGEN STUTTGARTER STRASSE RFA
99998	S S S SOLID STATE SCIENTIFIC,INC., MONTGOMERYVILLE INDUSTRIAL CENTER, MONTGOMERYVILLE PA 18936 USA

TX 35
SELF-TEST
MAINTENANCE GUIDE

– Power on

– Self-test execution

– Set rear panel switch in "1" position
– Reset

The following sequence is observed :

– screen display of a page of squares
– head initialization
– screen display of a page of dots
– keyboard lamps on (approx. 1 second later)

After extinction of the lamps, display of the message "display self-test terminated".

– cursor positioned on line 2
– printer goes to "1st character" position, or reinitializes (old version)

Display and printout of message "Printer module tests terminated Prog : 23 etc."
" " " "Preparation module " " " "
" " " "Line module " " " "

On the screen

– Display test :
A, B, C . . . . . .

On printer

– Printer test :
A B . . . . . (slipping left)
A B . . . . . (straight)
A B . . . . . (slipping right)

On display and printer

– Site option : 00100000
– Code (customer IF)
– Line test . . . . . :
– RYRYRY . . . . . 1st line 69 characters, 2nd line 68 characters, etc.

Termination of line test is obtained by moving the rear panel switch to "0". The printer disengages the paper, and the screen displays "keyboard test".

The operator tests his keyboard by striking the appropriate keys as follows :

– Display of displayable character, followed by its machine code
– Display of a white, followed by the machine code for the function keys

– Exit from keyboard test is obtained :

– immediately by striking the "clear" key
– automatically after a few seconds delay

– The machine goes to its quiescent state.

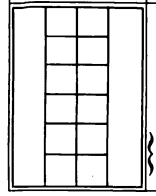
"Desieter et Granier" two-wire option with no ground return

Move the rear panel switch to the "0" position. If the test fails to terminate, call in the maintenance department for line delooping.

– Anomalies

I) "Display self-test terminated" displayed permanently and warning buzzer sounds off

– Preparation module –

LAMPS	DEFECTIVE CARD	DISPLAY
	MEMORY (RAM) MPU (ROM) DISPLAY INTERFACE KEYBOARD I/O INTERFACE NOT USED	01 XX 02 YY 03 04

– Two lamps in the operating keyboard come on, indicating the defective card.
– The display unit can be used for line definition of the fault (workshop trouble shooting).

II) "Display self-test terminated" flashes, with pulse trains

– Line module –

NUMBER OF ALARMS PER PULSE TRAIN	DEFECTIVE CARD	OBSERVATIONS
0 or 1	MPU (ROM)	
0 or 2	MEMORY (RAM)	0 to 16 K
3	MEMORY (RAM)	16 to 32 K
4	CODE + MATCHING COMMAND	
5	ACIA I/O INTERFACE	
6	MATCHING	

Note : With the line switch in position "1", the telegraph matching LEDs flash in step with the alarm buzzer.

III) "Display self-test terminated" flashes and alarm buzzer sounds off

– Defective links between line and preparation modules

Defective card :
– Keyboard I/O interface
– ACIA I/O interface

Note : With the line switch in position "1", the telegraph matching LEDs flash in step with the alarm buzzer.

IV) "Display self test terminated" on permanently, buzzer does not sound off

– Preparation and line modules defective

See paragraphs I and II

V) Display of :

"Display self-test terminated"

"Printer module : test terminated : programme 23 ..."

Defective card :
– MPU printer card
– Printer interface card
– ACIA I/O card
– Power amplifier
– Sensor
– Cassette blocked
– No more paper

VI) No R-Y line test

Defective card :
– Code card
– Telegraph matching card
– Connection module
– Telegraph power supply
– Back plane

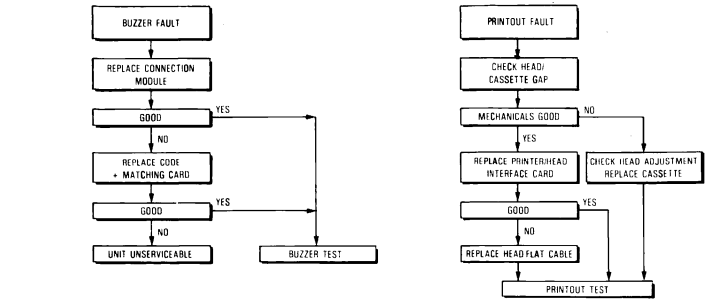
VII) Keyboard test

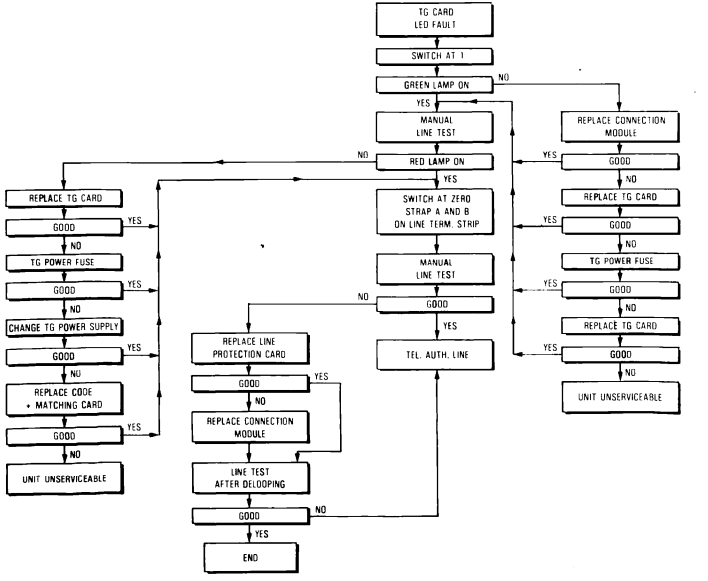
Defective card :
– Keyboard
– Keyboard interface
– Keyboard link or keyboard interface

START-UP TESTS

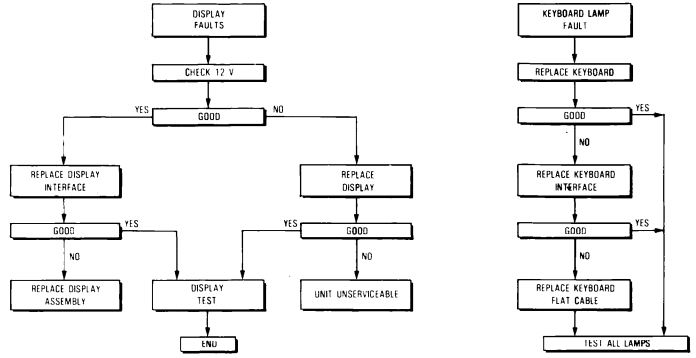
– Write a text to the screen
– Cut off line power supply
– Switch on line power supply
– Check that the text is still displayed
– Execute printout
– Check clearance over paper cutter
– Transfer to memory
– Execute display
– Execute duplication
– Obtain display of short dial code table
– Execute clear
– Execute memory capacity tests :
– 16 K = 21 texts of one character
– 32 K = 53 texts of one character
– Execute "no more paper" tests
– Check protective function
– Line test :
– Manual
– Automatic

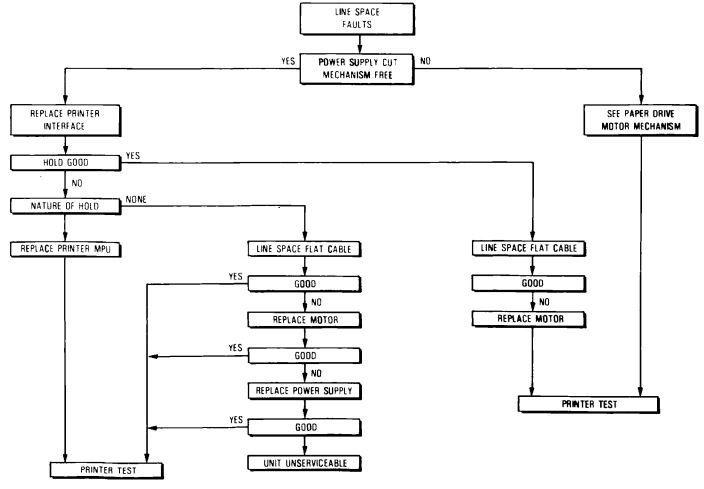
PERIPHERAL TROUBLE SHOOTING





PERIPHERAL TROUBLE SHOOTING





Société d'Applications Générales d'Électricité et de Mécanique

Printed in France
SA 12626

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S.A. CAPITAL : 67.980.000 F
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